

Amateur Radio

June 1997
Volume 65 No 6



Journal of the Wireless Institute of Australia



Full of the latest amateur radio news, information and technical articles including...

- **An RF Inductance Meter - Lloyd Butler VK5BR**
- **70 cm from a Two Metre Rig - Peter Parker VK1PK**
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Amateur Radio



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month of issue, and you are a financial member of

the WIA, please check with the Post Office before

contacting the registered office of the WIA.©

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Cover

The crew of the IOTA DXpedition to St Peter Island standing in front of the 20 metre 4-Square vertical antenna array with the operating tent in the background. Standing (l to r) are Paul VK5MAP, Terry VK5IED, Mal VK6LC and Neville VK5WG, while kneeling is VK5 SWL John. See page 14 for full details of the DXpedition.

BACK ISSUES

Available direct from the WIA Federal Office, only until stocks are exhausted, at \$4.00 each (including postage within Australia) to members.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at \$2.50 each (plus \$2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Representing the Australian Amateur Radio Service -
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David Wardlaw	VK3ADW
Neil Penfold	VK6NE

Editor's Comment

Broadening the Mind

I had not originally intended to base a "Comment" on the trip which my XYL and I made in April to Singapore and Malaysia, but the more I considered the more I asked myself, "why not?". My original reluctance was because the trip was primarily for family reasons and was unconnected with amateur radio, with one exception.

The exception was that I renewed acquaintance with an old friend, David Rankin 9V1RH, in his adopted country of Singapore. He still retains his original call of VK3QV for use on occasional trips to Australia. David is closely involved with the Region 3 administration of the IARU and is also active on 21 MHz, the more so since his recent retirement from full-time employment.

From conversation with David, and others also, both in Singapore and Malaysia, I gleaned a number of "bits of trivia" about both countries which may interest prospective visitors or migrants, whether amateurs or not.

One must reside in Singapore for at least six months before being permitted a 9V1 licence; a hand-held from the airport while passing through would not be welcome! Singapore packs about three million people into only about nine hundred square km, so most people live in high-rise apartments. Very few of the local amateurs can do more than dream about installing 20 m beams. Most roof-tops are covered with TV antennas anyway!

Something like six million tourists pass through Singapore each year, so if tourism is not the major industry, it must go close! The local taxis are all diesel-engined (by law); the traffic is almost incredibly dense but well organised. Private cars are discouraged in several ways (cost of registration, special permits for central city areas, cost of petrol) but the atmospheric pollution is considerable. Public transport is excellent and includes a largely underground MRT (Mass Rapid Transit) system.

Across the Strait of Johore into Malaysia and things are rather different. Malaysia has about the same population as Australia (18 million) but, although far smaller than Australia, it is far bigger than Singapore. It has plenty of private vehicles, excellent roads, including marvellous toll-ways (and the tolls are not prohibitive!), and not quite as much accent on high-rise, even in the cities (we saw Malacca, Kuala Lumpur and Penang).

However, Kuala Lumpur (KL to everyone) has what are claimed to be the world's highest twin towers, only just finished and ready for occupation. KL is frantically building in preparation for its hosting of the 1998 Commonwealth Games.

I hope this information is of interest about some of our near neighbours.

Bill Rice VK3ABP
Editor

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk or via e-mail are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. A pamphlet, "How to Write for *Amateur Radio*", is available from vk3br Communications Pty Ltd on receipt of a stamped, self addressed envelope.

■ WIA News

Roger Harrison VK2ZRH, Federal Media Liaison Officer

Neil Penfold VK6NE Returned as Federal President

The Annual General Meeting (AGM) of WIA Federal, held over the weekend of 3-4 May, saw the Federal Council re-elect Neil Penfold VK6NE as Federal President for a fourth term. The position was contested by Peter Naish VK2BPN, who was nominated by the NSW Division.

Two directors were elected to the Federal Executive: Peter Naish VK2BPN, and Rowland Bruce VK5OU. Lance Bickford VK4ZAZ, who was a member of the Executive from 1995, did not re-nominate and no further nominations were received. The 1997-98 Executive comprises Chairman, Neil Penfold VK6NE (a position the Federal President holds automatically under the WIA Articles), Peter Naish and Rowland Bruce. The Executive subsequently returned Peter Naish as WIA Federal Secretary, which position he has held since 1995.

Apart from considering the annual financial report and report from the Executive, the WIA AGM dealt with annual reports from Federal Co-ordinators and a total of 14 motions on notice from Divisions, the largest number considered for many years. A number of motions sought changes to the WIA Federal Articles to permit some method of proportional voting by Divisions meeting as the Federal Council.

A special resolution proposed by the NSW Division and seconded by the ACT Division proposed a scheme of allocating voting blocks to Divisions according to membership numbers. Divisions, as the members of the WIA Federal company, each have one vote under the present Articles. The scheme proposed that the two largest Divisions could not act together to have a controlling vote. The support of another Division would be necessary. The motion was lost, as was another motion

from the Victorian Division, seconded by the ACT Division, that the Council take steps to amend the Articles to provide proportional voting on the basis of financial equity. The matter has been referred to the Federal Council sub-committee dealing with updating the Articles, working in conjunction with the Council's strategic planning initiatives.

A resolution to amend the Articles so that Divisions could only appoint an ordinary voting member of the Division as its Federal Councillor was proposed by the NSW Division and seconded by the ACT Division. The motion was lost following debate during which it was revealed that the proposal restricted the right of a Division as a corporate body to appoint whoever they wished and that the Corporations Law ensured this right. A Division could send its solicitor as its representative to the Federal Council, for example.

A motion from Victoria that Divisions, in the future, wishing to administer their own membership records receive a maximum rebate of \$1 in the Federal subscription component, was seconded by the NSW Division. The motion was passed. Queensland is the only Division currently administering its own membership records and receives a higher rebate following an earlier agreement with the Federal Executive.

The Federal Council has agreed to move on establishing the necessary administrative resources to take over the issuing of Amateur Certificates of Proficiency and the administration of call signs, should the Spectrum Management Agency, or the Australian Communications Authority (ACA), move to devolve the process in the future. The WIA proposed, and has adopted as policy, taking over these functions in the Amateur Licensing submission presented to the Minister for Communications in February. The WIA is to follow

up with a formal application to the authorities.

SMA liaison, or ACA liaison from July, will continue to be conducted by the WIA-SMA Liaison Team.

International representation was a major item for consideration by the Federal Council at the AGM. The Council voted to fully fund two delegates to attend the International Amateur Radio Union Region 3 Conference in Beijing in September. The IARU Liaison Officer, and the official delegate to the Conference, David Wardlaw VK3ADW, is automatically one of those. The Federal Council voted to send Federal President Neil Penfold VK6NE as the other fully funded member of the team. Wally Watkins VK4DO was previously elected as a self-funded member of the Conference team.

ITU Conference Co-ordinator, David Wardlaw VK3ADW, outlined the issues of concern to the Amateur Service on the agenda of the World Radio Conference, WRC-97, to be held in Geneva later this year, and advised the meeting that the costs for him to attend would be some \$10,500. A motion proposed by the ACT Division and seconded by NSW, that the Council send two people to Beijing, two people to the NZART annual conference (in May) and that no representative be funded for the WRC-97 Conference in Geneva, was lost. In debate, the consensus among Federal Councillors was that international representation at the ITU level was the WIA's highest priority, with IARU representation ranking second, a presence at any other regional events coming behind them.

In other discussions at the AGM, the Federal Council rescinded a move earlier this year to conduct licence examinations at eight fixed times through the year, the West Australian Division is to take over co-ordination of the VK/ZL/Oceania Contest, a proposal to move the Federal Secretariat to Sydney was rejected, the VHF/UHF Field Day and the South Pacific 160 m contests are to become official WIA-sponsored events, and the annual Call Book is to be replaced by another publication in view of moves by the SMA to publish the amateur call sign register on the Internet this year (see separate news item).

Another VK2 Wins Recruitment Prize for March

New South Wales Division member, Mr D Peake VK2AO of Colo Vale, is the lucky winner of the Fluke 12B digital multimeter, the prize in the WIA's 1997 recruitment campaign for members who joined in the month of March.

The winner's name was drawn at the WIA Federal AGM held over 3-4 May. A NSW member also won the February draw.

Each month throughout 1997, a Fluke 12B digital multimeter, worth \$195, is given away to a lucky winner who joined a WIA Division in the previous month. The Fluke multimeter prizes have been generously donated by Philips Test & Measurement.

The Fluke 12B measures AC and DC voltage (with auto-selection above 4.5 V), resistance and capacitance from 1000 pF to 1000 µF. The instrument features a simple rotary dial, a 4000-

count liquid crystal display, and diode and continuity testing. Its "continuity capture" feature indicates intermittent open and short circuits. It comes with test leads and a two-year warranty. Fluke is the world's pre-eminent manufacturer of digital test instruments and the Model 12B is from their recently-released range of hand-held instruments.

Every newcomer to electronics and amateur radio needs a good multimeter, and every seasoned enthusiast could always do with another one!

Membership recruitment advertisements appear in each issue of *Amateur Radio* magazine, and in *Radio and Communications* magazine.

Membership recruitment and renewal advertisements are also on WIA Divisions' World Wide Web pages on the Internet.

All Amateur Licence Details on the Internet

By the time this is published, the SMA should have the complete register of amateur licence details available for access on the Internet, as the Agency planned to publish them early in June. The SMA has an obligation to make its register of licence details publicly available under the Radiocommunications Act 1992 and a Determination of 27 March 1997, to take effect from 2 June. This covers all Apparatus, Spectrum and Class licences.

For Apparatus licences, under which amateurs are currently licensed, the

details to be made available include the licensee's name and address (as shown on the licence), the call sign, the client number assigned by the SMA, the licence type, the dates of effect and expiry, the status (eg if suspended), and any special conditions, etc. Amateur licensees who previously had their details suppressed from publication will have the details published on the Internet and in the SMA's CD-ROM register as it is now required by law to publish them.

The SMA has advised the WIA that if amateurs wished to have only a postal address (eg a PO Box) related to their licence, rather than their home address, they can apply to their local SMA Area Office to change their licence details. The SMA advised that such changes would be made to the register within a day of receipt.

The SMA's Web site is at www.sma.gov.au.

New Allocation Sought at 80 m

Members will be aware that the WIA is pursuing a new amateur allocation in the band 3750-3900 kHz, as secondary users, on a time-sharing basis so that amateurs may use the allocation outside standard business hours. It is proposed this new allocation replace the existing "80m DX Window" at 3795-3800 kHz.

The WIA has suggested the lower 10 kHz of the proposed allocation, from 3750-3760 kHz, be reserved for emergency use, to provide a common allocation which would permit communication between government emergency services and WICEN stations during declared emergencies.

Times suggested for using the 3760-3900 kHz allocation are from 1700-0830 hrs local time, Monday evenings through Friday mornings, with 24-hour operation permitted over the weekends, commencing from 1700 hrs LT on Fridays through to 0830 hrs LT on Mondays.

The requested band allocation spans the variety of allocations available to amateurs in all three ITU regions. The WIA has suggested access to the allocation be permitted to amateurs holding Unrestricted and Intermediate licences.

As government emergency services and state police use a series of channels between 3700 and 3750 kHz as principal communications channels, the WIA has not requested an allocation below 3750 kHz.

The WIA made a preliminary submission to the SMA in late 1995. Following discussions with the SMA, the WIA presented an updated proposal in mid-1996. The SMA then asked for further particulars to be researched and outlined and suggested the formation of a WIA-SMA working group. This working group, comprising the WIA's SMA Liaison Team and several officers from the SMA, has been conferring on the requirements of the WIA's submission for a new allocation, which was anticipated to be completed in May. No date for a decision on the proposed allocation has been indicated at this stage.

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Licence Conditions Determination Replaces TLLs

The previous series of Technical Licence Conditions (TLLs) specifying the complete conditions pertaining to each Amateur licence type has been replaced with a single document, the *Radiocommunications Licence Conditions (Amateur Licence) Determination No 1 of 1997*.

The Amateur Licence LCD contains a number of changes sought by the WIA following the release of the TLLs in 1995, which were revised in 1996. Restrictions on club station operation have been relaxed, following representations from the WIA, as have some previous restrictions on repeater systems, among other changes. All the allocated bands and emission modes are provided in comprehensive tables.

A number of issues relating to conditions imposed on amateur operations are still being pursued by the WIA with the SMA, including the operation of packet radio wormholes, remote control of repeaters and beacons, licence fee charges for beacons and repeaters, and the allocation of special event call signs.

The complete LCD is available from SMA Area Offices, or on their Web site at www.sma.gov.au/support/legal/determi/nlcd/amateur.htm.

The SMA has also recently updated its information paper on the Amateur Apparatus Licence. This contains information in "plain language" (not the legal language of the LCD), regarding qualifications, licensing options, examinations, call sign allocation and use of special prefixes and suffixes, third party arrangements, JOTA station licensing, and fees, etc. Copies of this paper are also available from SMA Area Offices or on their Web site at www.sma.gov.au/spectrum/licence/apparat/amat.htm.

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- ☒ all membership grades

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Call Book to be Replaced With New Publication

The WIA Federal Council has a subcommittee working on proposals to replace the annual Call Book with another style of publication. A number of issues have prompted the move, including declining Call Book sales over the past four years, demand for a digital Call Book listing on disk, and recent moves by overseas publishers to only publish their call books in digital form on CD-ROM.

Discussions by the Federal Council over the future of the Call Book began in 1996 and a subcommittee was subsequently formed earlier this year.

SMA Considering WIA Licensing Submission Proposals

The SMA is considering the proposals in the WIA's submission to the Communications Minister on Amateur Licensing in their review of non-assigned Apparatus licence types.

The acting executive manager of the SMA's Business Directions Group, Peter Stackpole, has written to WIA, advising that the courtesy copy of the submission sent to the then Spectrum Manager, Christine Goode, was passed to him for consideration. The WIA sent a copy of the submission to Christine Goode following its presentation to the Minister.

In his letter to the Institute, Mr Stackpole said, "The WIA's submission is timely, as we are presently reviewing our licensing arrangements for all non-assigned apparatus licence types. We will take into account the WIA's views

From preliminary proposals discussed, it is anticipated that a replacement for the Call Book would be a more broadly-based publication containing reference material of wide interest among the amateur and short-wave listener community and related enthusiasts. Also being considered are providing the call signs listings in digital form and various options of providing amateur call sign listings in printed form for those who don't have suitable computer or Internet facilities.

The timing of release for the proposed new publication has not yet been settled.

and proposals in our review, although our current review is working within the current framework of licensing established under the Radiocommunications Act 1992. Hence, our review will not be able to address the WIA's recommendations for the creation of a new form of licensing."

His letter went on to say that, "The proposal for an entirely new form of licensing for the Amateur Service is one which will have to be picked up in the review of the Radiocommunications Act, which we expect the Department of Communications and the Arts will commence in a few months."

Mr Stackpole said, "I understand that a copy of your submission has been presented to the Department, so we'll work with them in considering the WIA's proposals."

World Amateur Radio Day

The WIA is supporting the promotion of *World Amateur Radio Day*, on Saturday, 20 September 1997. This date is for the promotion of amateur radio to the community, at local and national level. It is supported by the International Amateur Radio Union.

Divisions, amateur radio clubs and societies, WICEN groups and other interested individuals or groups, are encouraged to stage promotional displays and events to promote to their communities what amateur radio is all about. The event is designed to work as an adjunct to other public promotion opportunities in which Divisions, clubs or groups are involved.

WIA Federal President, Neil Penfold VK6NE, said: "Displays and demonstrations in shopping precincts and malls, in parks where the public gather, at Scout and Guide or specially-arranged school events are all suggested as ways and means of supporting *World Amateur Radio Day*."

Those planning *World Amateur Radio Day* events are urged to contact the WIA Federal Media Liaison Officer with details for inclusion in *WIA News*.

Minister to Open North Qld Convention

The Minister for Communications and the Arts, Senator Richard Alston, has agreed to open the North Queensland Amateur Radio Convention, to be held over the weekend of 26-27 September, 1997.

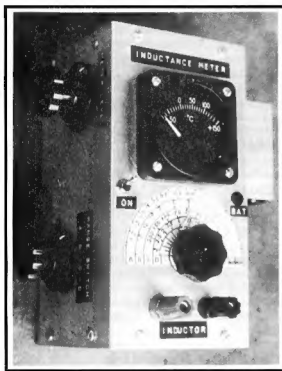
Venue for the Convention is the James Cook University in Townsville. Events to be staged include displays, lectures, discussions and amateur radio activities such as fox hunts, a homebrew competition and an equipment auction. There will be a banquet on the Saturday night at Tumberton Lodge.

When you buy something from one of our advertisers, tell them you read about it in the WIA Amateur Radio magazine

■ Test Equipment

An RF Inductance Meter

Lloyd Butler VK5BR has devised a simple unit which measures from 0.1 μ H to 3 mH.*



The assembled and calibrated RF Inductance Meter.

Introduction

If the radio amateur builds or services his own gear, he needs, if nothing else, some means to measure the basic units of resistance, capacitance and inductance. Most amateurs would have a multimeter which can measure resistance. Some digital multimeters include capacitance measurement. Bridges which measure both resistance and capacitance are quite common items in the radio shack but not many radio amateurs have the means to measure inductance.

If one has access to a Q meter, an unknown RF inductor can be resonated with the tuning capacitor on the Q meter.

The inductance is then calculated from the frequency used and capacitance indicated on the tuning capacitor scale. This is a method I have used in the past but I felt I needed something which could give me a direct reading of inductance to eliminate the calculation and speed up the process.

For my own experimental use, I keep a range of miniature inductors (or chokes, as shown in the catalogues). These are made by a number of different manufacturers and are normally available from electronics stores in preferred values starting at 1 microhenry and sometimes going as high as 10 millihenries. Some look like small resistors and some like small capacitors. Some are colour coded and some are marked in inductance value. They generally have quite high Q and measure quite close to their nominated value. I find these inductors very useful for application in filters and tuned circuits which use two pole inductors (ie no taps or secondary winding). Sometimes I find I am confused in reading the coded or marked value and need some means to check it out.

The inductance of air wound coils can be calculated by using established methods such as Wheeler's formula. The inductance of coils with ferro-magnetic cores can also be estimated using the Al

factor data supplied by makers of the core material. However, a means to measure the inductance is useful to check if one is in the right ball game.

These are the reasons which led me to build the inductance meter described in this article. This instrument measures inductances from 0.1 microhenry to 3 millihenries divided into four ranges set by a switch. It operates from 12 volts, and is powered by eight AA type cells attached to the unit.

Background

I initially referred to Drew Diamond's unit in *Amateur Radio*, November 1992 to see if it fitted my needs. Drew used a fixed crystal oscillator at around 3.5 MHz to source a bridge where he compared the unknown inductor against a known 5 μ H inductor. The bridge was balanced by adjusting a potentiometer which had its scale calibrated in terms of inductance. The meter measured a range of 0.5 to 20 μ H.

I needed a wider inductance range than this. Also, I was a bit concerned that no provision had been made in Drew's circuit to balance out the resistance components of the reference and unknown inductors. If the two resistance components were largely different, and particularly if one of them (the unknown) was fairly low in Q, the dip shown in the balance meter would occur with the pot reading offset from the calibration. I guess I could have modified the bridge to include resistance balance but I decided to operate my circuit in a different way.

I have used a fixed frequency source as in Drew's circuit but extended this to four frequencies to expand the inductance range. Instead of using the bridge, the unknown inductor is resonated by adjusting a variable capacitor in parallel with the inductor. The parallel tuned circuit is energised from the oscillator source via a meter which monitors the current into the circuit. The system is illustrated in Fig 1. Resonance is indicated by a dip in current as shown on the meter. A dial attached to the variable capacitor is calibrated in terms of inductance.

Circuit Detail

Influenced by Drew's crystal-controlled, Colpitts type oscillator

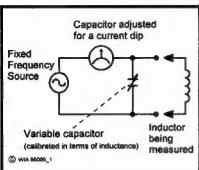


Figure 1 - RF Inductance Meter - principle of measurement.

circuit, I wired up the circuit and proceeded to search through my box of crystals for precise crystals which would give me the frequency spread I needed.

This proved to be a bit difficult as I needed to space the frequencies carefully so that each inductance range just overlapped the adjacent one. I finally decided that crystal controlled stability was not needed and substituted selected inductors from my store of miniature chokes. I settled on four frequencies of 16 MHz, 5.2 MHz, 1.32 MHz and 350 kHz for four ranges labelled A, B, C and D.

The complete circuit of the inductance meter, which includes the oscillator (V1), is shown in Fig 2. The oscillator inductors L1 to L4, switched by S1a, are 1 μ H, 12 μ H, 180 μ H and 680 μ H. With capacitors C4 and C5 fixed, I found difficulty in making the circuit work over the whole frequency range without some other component change apart from the inductors. Switch S1b, ganged with S1a, connects in C2 and C3 on the lowest frequency, and R3 or R4 are paralleled with R5 to increase emitter current on the higher frequencies.

In retrospect, if I decided to build the unit again, I think I would prefer to use the lambda negative resistance circuit which I recently described in a dip meter. The lambda circuit did not require the extra switching and its waveform was much better.

The transistor used for V1 is a type 2N3563 but any other small signal NPN transistor with a high frequency cut-off would do the job.

The inductance measuring circuit is isolated from the oscillator by emitter follower stage V2. The tuning capacitor

C9 in the measuring circuit is a two gang 450 pF miniature variable with both sections paralleled to provide a capacitance range of around 40 to 900 pF.

The current into the measuring tuned circuit is monitored by a 50 micro-amp meter connected via an associated rectifier circuit. RF Drive is set by potentiometer RV1. This must be adjusted when making a measurement as the off-resonant current varies quite a bit, particularly in changing from one range to the other.

The test procedure is as follows: First set the drive to minimum. Connect the unknown inductor. Advance the drive to near full scale deflection. Adjust the capacitor for a dip and read off the inductance. Return the drive to minimum in case the meter goes beyond full scale next time it is used for a measurement.

Using the frequencies and variable capacitor nominated, the inductance range is as follows: Range A, 0.1 to 1.5 microhenries; Range B, 0.9 to 20 microhenries; Range C, 18 to 250 microhenries; and Range D, 240 to 3000 microhenries.

Powering

To make the unit more portable, it is powered from a dry battery. The oscillator was not stable at a supply voltage below 8 V and operation could be marginal from a 9 V battery when it is partly discharged. Because of this I decided to use a 12 V battery and stabilise the voltage at 10 V.

This is set by two 5.1 V 400 mW zeners (ZD1 and ZD2) connected in series, only because I didn't have a 10 V zener on hand. The LED with the 9 V zener (ZD3) in series is a little circuit to indicate when the battery needs replacing. Normally the LED glows dimly but, if the rail voltage falls much below 10 V, the LED extinguishes. The type of LED shown has an internal series resistor. This is a type I had available but for the usual LED, an external resistor of at least 1000 ohms would be needed to limit current through the diode.

Assembly

Most of the components used, including the aluminium box, the 50 μ A meter and the variable capacitor, were

recycled from dismantled gear. The meter, mounted in a deep tubular housing and calibrated with a temperature scale, must have been originally recovered from an aircraft instrument panel (where it measured exhaust manifold or cylinder head temperature! Ed). The calibration in temperature was of no concern as the meter is only used to indicate the tuned circuit current dip.

Inductors L1-L4 and components C2, C3, R3 and R4 were mounted around rotary switch S1. The rest of the minor components were mounted on several single-row tag strips at convenient places inside the box.

For the critical capacitors in the oscillator circuit (C1 to C5), silver mica was used (I have little faith in ceramic capacitors for such applications). There were no special precautions taken with the wiring and some leads were a little longer than they ought have been. However, I experienced no problems because of this and it all worked fine once I had won my battle with the oscillator. Minimising lead length between the variable capacitor and the test terminals is important as these add inductance in series with the test sample. This is corrected for in the calibration but it could be a problem in measuring small inductors if too large.

The layout of meter and controls is shown in the photograph. As the case was recycled it was not quite made to order. With the meter and calibrated scale on the top, there was insufficient room for the drive control and the range switch and these were mounted on the side. Also, whilst the inside was by no means cramped, there wasn't quite room to mount the 12 V battery holder internally and this was fitted externally on the side opposite to the drive and range switch.

The dial calibration scale in four sections, but without calibration points, was drawn up on paper and glued to the box. Calibration points were added later. A cursor was made from perspex sheet and glued to a knob mounted on the variable capacitor shaft.

Calibration

Without access to another accurate

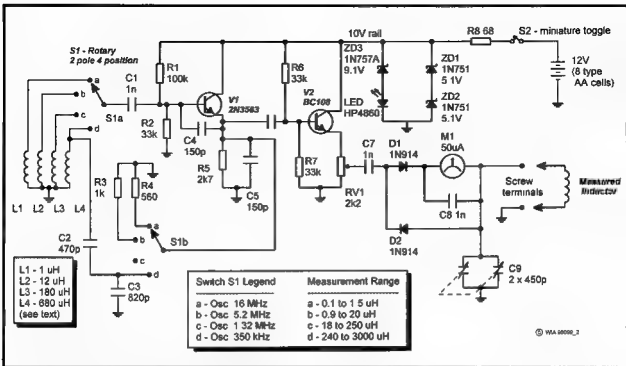


Figure 2 - RF Inductance Meter - circuit diagram.

instrument calibrated for small values of inductance, a little bit of ingenuity was needed to calibrate the unit. In my case, I was able to make use of my own range of miniature chokes. Obviously these are made to a tolerance but, by using a number of samples, including different samples from different brands and using various combinations in series and parallel, I averaged out readings to obtain each calibration point marked on the scale.

Had the range of reference inductors not been available, I might have used the following method: Firstly a reference unit scale (say 0 to 100) is provided as a further scale section. Disconnect the variable capacitor from its circuit and, using a digital capacitance meter or a capacitance bridge, measure the capacitance at a number of points over its adjustable range. Record these capacitance values against the dial calibration points. For one of the four oscillator frequencies, calculate the inductance required for resonance at each capacitance value using the normal resonance formula. Using graph paper, inductance can now be plotted against calibration units by joining up the

reference points derived. Repeat the exercise for the other three frequencies resulting in a set of calibration curves to mark off the scale at will. Alternatively (but not so convenient), one might choose to only have the unit scale on the instrument and always refer to the calibration curves when taking a measurement.

Using this second method, a correction factor would need to be made on the lowest inductance scale because of inductance in the leads between the capacitor and the test terminals. For example, a lead length of 10 cm would add in around 0.1 uH. For the lowest scale, it would be wise to make up several small air-wound inductors, calculate their inductance using Wheeler's formula and use them as a reference for correction.

Some Final Thoughts

The article describes a simple circuit which can check out inductors in the range of 0.1 uH to 3 mH. In fact, the main circuit complication is the provision of an oscillator which can work on four widely different frequencies. A Colpitts type oscillator has been used in the unit

described but any other form of oscillator could be made to do the job. The actual frequencies are not too important, except that they need to be spaced so that the inductance ranges are complementary and slightly overlap each other to ensure a defined dip. The frequency spacing might also be dependent on what variable capacitor can be obtained and what tunable capacitance range it can provide.

Concerning the oscillator as built, suitable frequencies were achievable using four fixed off-the-shelf inductors to set tuning for the oscillator. However, because of variations in tolerance of these components and associated capacitors, a repeat of the circuit might involve some trimming of the inductor values. One might also choose to wind up the coils, perhaps with provision of a tuning slug so that precise frequencies could be set.

Some ingenuity is needed to calibrate the unit and I have discussed ways of how this can be done. Having completed this, the unit becomes a very useful instrument to have at the test bench.

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Transmitters

70 Centimetres From a Two Metre Rig

Peter Parker VK1PK* describes an experimental frequency tripler.

If you are one of the many who would like to try 70 cm FM, but baulk at the cost of a new transceiver, this project is for you. It is a simple diode frequency multiplier that will allow you to transmit on 70 cm FM with a two metre transceiver. The only requirement is that the two metre exciter must be continuously tunable, or almost so, if full coverage of all repeater and simplex frequencies is desired. The Yaesu FT290R two metre transceiver with 100 Hz stepped tuning and selectable 0.5/2.5 watt power settings is suggested as a suitable exciter with which to drive this multiplier. It is assumed that you already own a scanner receiver capable of receiving UHF signals.

Circuit Description

This tripler is easy to build and uses just eight components. The multiplication is performed by a varactor diode. The basic design is not new; it appeared in the 1977 ARRL Handbook (Ref 1). The third harmonic of the 146 MHz input signal is taken off the varactor diode and fed to two tuned circuits on the output frequency. The second harmonic of 146

MHz is attenuated by a series-tuned idler circuit wired in parallel with the varactor diode – this is required for efficient operation.

Construction

Most of the construction work in this project consists of cutting and soldering pieces of blank printed circuit board material together to form the enclosure and the two UHF inductors. Because it is so easy to cut, single-sided fibreglass circuit board stock is recommended.

The bottom panel of the enclosure should be cut first. Then mount the two vertical divider pieces and the strip of PCB material that forms L5. There are no nuts and bolts used in the construction of the tripler. Circuit board pieces are simply soldered together.

Working back from the output end, install C6 and C4 which, together with the two resistors and the varactor diode, support L4. Ensure component leads are kept as short as possible. One centimetre of wire at 400 MHz is equivalent to one metre of wire at 4 MHz. After constructing the 292 MHz series-tuned idler circuit, move on to the 146 MHz input tuned circuit.

Note that all trimmers are soldered to the bottom mounting board. Where mounting is difficult for C1, C2 and C3, use circuit board pins as stand-offs to minimise the risk of short circuits and to facilitate mounting the three VHF coils. Do not forget C5. This capacitance is simply two pieces of insulated wire loosely twisted together (see *Tech Editor's Note*).

Whereas L1 and L3 are made of tinned copper wire, L2 is wound from insulated wire to avoid it touching L1. Coil-winding details are provided in the parts list at the end of this article. A quarter wavelength piece of stiff wire 165 mm long is soldered to point "X" on L5 to form the antenna.

Once all components have been installed, attach the four sides of the box, not forgetting to first drill holes for the 146 MHz RF input socket and C4 and C6.

Adjustment

Ideally, this device should be tuned-up with the aid of a frequency counter, 70 cm receiver and a spectrum analyser. Those without the latter could transmit on an unused two metre frequency on low power and find their third harmonic on 70 cm with the scanner without the tripler connected. This harmonic should be fairly weak when the scanner is moved away from the two metre transceiver. Adding the tripler and experimenting with the trimmer settings should yield a 70 cm signal which is much stronger.

The settings of all five trimmers are

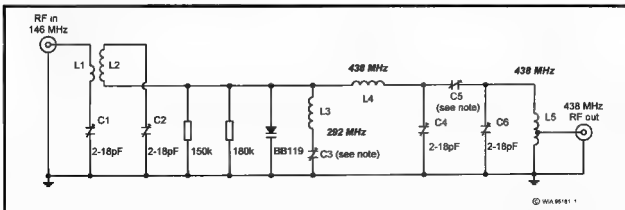


Fig 1 - Schematic diagram of the 2 m - 70 cm tripler.

critical and to some degree interdependent. Final tune-up could be done on a simplex frequency with another 70 cm-equipped station, perhaps mobile travelling away from you and stopping at regular intervals to monitor your signal. Liaison could be carried out on two metres simplex.

Operation

Speaking into the two metre transceiver should result in a clear and undistorted signal from the repeater being received on the scanner. If the repeater drops out on voice peaks it is likely that you are speaking too close to the microphone. Multiplying an FM signal frequency also multiplies its deviation. This limitation must be accepted unless you are willing to live with low deviation on two metres. In this case the deviation of the two metre transceiver should be reduced to approximately 1.5 – 2 kHz. Nevertheless, in practice, operation of this tripler with an un-modified two metre transceiver has proven to be entirely satisfactory.

The efficiency of this tripler is not known. Nevertheless, with a quarter wavelength stiff wire antenna soldered direct to L5, 0.5 watts input on two metres is sufficient to produce a readable signal to a repeater located seven kilometres away (not line of sight), while 2.5 watts gives a noise-free signal from this location.

Conclusion

Despite the hard-to-build reputation that UHF radio projects seem to attract, the prototype went together without a hitch with no changes to component values being required. While some values are slightly different from those specified in the original ARRL design, these substitutions were driven solely by component availability considerations and not by any difficulties with the original design. Note that this tripler is only suitable for CW and FM service and will not work on SSB.

While this has not been tried by the author, it might be possible to modify the circuit to multiply to other bands, for instance from 432 MHz to 1296 MHz. As well as transmitting applications, this

circuit may also lend itself for use in receiver local oscillator chains.

Component List

Resistors

- 1 150 k 1/4 watt
- 1 180 k 1/4 watt

Capacitors

52-18 pF trimmers (salvaged from ex-commercial UHF equipment)

Inductors

- L1 3 turns, 10 mm ID, 10 mm long (partially inserted in the "cold" end of L2).
- L2 6.5 turns 10 mm ID, 20 mm long (insulated wire).
- L3 3.5 turns 10 mm ID, 12 mm long.
- L4 strip of single-sided PCB material, 82 x 10 mm, mount 10 mm above base.
- L5 strip of single-sided PCB material, 86 x 10 mm, mount 10 mm above base, antenna tap "X" 25 mm from earthed end.

Semiconductors

1 BB119 varactor diode (sold by the CW Operators QRP Club)



Radio and Communications

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It started out as a nostalgic look at 50 Years of 50 Mags — an impressive international DX record for a capricious band — but the third and final part of this fascinating yarn changes direction to teach the secrets of six metre propagation. We also check out a new Australian TNC.



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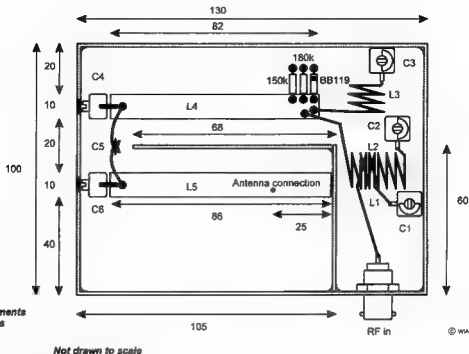


Fig 2 - Internal construction (not to scale) of the 2 m - 70 cm tripler

Miscellaneous

1 BNC socket, fibreglass printed circuit board material, small length of insulated wire.

References

1. 1977 ARRL Handbook, page 218.

Technical Editor's Note

Peter uses a gimmick capacitor for this coupling. Some experimentation will be required as the wavelength is 70 cm and the length may be short. The ARRL design used tabs 6 x 9 mm approx, spaced approx 3 mm. The UHF trimmers used in the ARRL design were 9 pF max, as against 18 pF, which may have some bearing on how critical adjustment becomes. Another alternative for the trimmers would be to use the high quality UHF piston types often available at hamfests

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BA1

WIA News

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of April 1997:

L30952	MR M BRAUN
VK1AEP	MR A E PEPPER CORN
VK1BKB	MR H M DE ARMAS
VK1DC	MR D R CAMERON
VK2ATP	MR K E PETERS
VK2IHV	MR A WETTASINGHE
VK2TJQ	MR B WITHERS
VK3EQ	MR D J WERKMULLER
VK3EWW	MR M MACE
VK3FBR	MR I DOWNIE
VK3PKQ	MR D MUSGROVE
VK3VCL	MR S FONTANA
VK5KAW	MR A C WILLISS
VK5NB	MR J A MCLACHLAN
VK5ZIP	MR J G ROWLEY
VK6CTL	MR J C LAIB
VK8NWF	MR W P FEENSTRA

Packet Radio Chip Seeks Manufacturer

While on business in Germany attending the 1997 Hanover Fair, the world largest industrial trade fair, WIA

News spotted an exhibitor displaying a system for wireless data transmission which employs the amateur packet radio protocol, based on KISS software embedded in an application specific integrated circuit (ASIC).

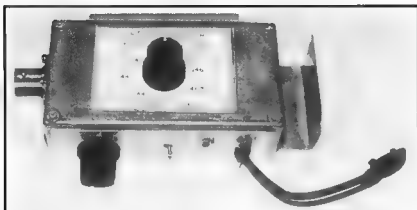
The single chip packet radio interface, devised by Bernhard Dwersteg of the University of Hamburg's department of computer science, employs the KISS (keep it simple, stupid) protocol, familiar to packet enthusiasts. Yes, Bernhard has his amateur licence.

The ASIC was developed in conjunction with Trinamic Electronic Design GmbH, and allows very compact packet data transmission systems to be built, Mr Dwersteg said. Apart from amateur packet radio, applications include commercial wireless data transmission systems and industrial data acquisition systems. They are looking for a manufacturer to incorporate the ASIC in transceivers for these applications.

■ Equipment Review

Two Metre Amateur Band DF Receiver

*Reviewed by Gil Sones VK3AUI**



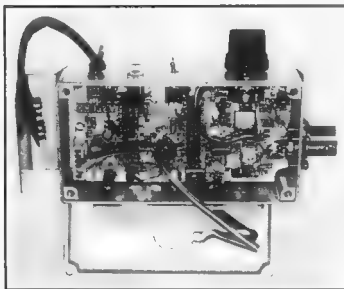
The Ron Graham Electronics ARDF 2 m receiver assembled from the kit-set by Gil VK3AUI.

A R D F has been growing in popularity. It is a mix of radio direction finding and orienteering. To take part you need simple but light and effective equipment. There are limited sources of ready built equipment which can be difficult to locate. Ron Graham Electronics has a kit which makes it possible to build a suitable 2 m DF receiver which runs off a 9 volt battery and is small enough to be mounted on the boom of a fox hunt Yagi beam antenna.

The receiver is a development of a design originally published in *Amateur Radio* magazine by Ian Stirling VK3MZ. The receiver uses an MC3662 IC together with a handful of other components to produce a small, sensitive and rugged receiver in a diecast box. Ron VK4BRG has developed and production engineered the design to produce a kit-set for those who need an ARDF receiver.

The kit comes complete

with all the required parts, and the board and case are pre-drilled. The PC board is fairly easy to assemble, although some thought and care is needed. There are a few coils to be wound and these should be wound carefully. Also, the design makes use of a number of component leads as connections between the two sides of the PCB and these connections,



An inside view of the ARDF receiver.

which are noted in the instructions, should be made carefully as they are needed for stability.

Instructions with the kit are good and should be read carefully as this is quite a sophisticated receiver project. It is helpful to lay out all the components prior to assembly and identify them. Also, check the fit of components prior to assembly as some pre-drilled holes may need to be eased.

A protective diode was found to have leads which were a trifle snug and the holes needed easing. Similarly, the potentiometers have locating lugs which need to be filed or holes drilled to accommodate them. The corners of the PCB need to be filed to allow it to be fitted into the diecast box. All fairly minor adjustments.

One thing to check was the connections of the BF981 RF amp as they were not in the instructions. Construction was simple and the kit operated when power was applied. Alignment is relatively straightforward with few adjustments needed to peak the tuned circuits and put the receiver on frequency.

The construction is simple and, while it is above the level of a basic constructor, it should be simple to anyone who has constructed other kits. Silk screening and plated-through holes would considerably reduce the level of skill required but these are luxuries which would require a much higher volume of production.

The documentation is good with only a few items needing attention. It is more than adequate and is better than some other kits.

The kit is a good way to build an ARDF receiver with little trouble and it eliminates the need to search for specialised parts. It should provide an entry into ARDF for anyone with a modicum of constructional ability.

The kit is available from Ron Graham Electronics, PO Box 323, Sarina Queensland 4737.

**Clv PO Box 2175, Cudfield Junction VIC 3161*

■ Operating DXpedition to St Peter Island – VK5ISL

Stephen Pall VK2PS*

South Australia has approximately 150 offshore islands, ranging in size from Kangaroo Island to tiny rocks and reefs only occasionally visible above the waves.

St Peter Island is located 32 degrees 16 minutes south, 133 degrees 34 minutes east, in the Nuyts Archipelago, Southern Ocean, Great Australian Bight (IOTA reference OC-220 – Zone 30).

The island is approximately 14 km long and 5 km wide, and lies approximately 15 km south-west from the port of Thevenard and the town of Ceduna. It is the home of the famous "King George Whiting" fish. Also resident are death adders, the dangerous black tiger snake, short-tailed Shearwater (Mutton Bird), seals and many arctic birds.

St Peter Island had a whaling and sealing station in the very early days of settlement and later was used for many years until 1987 as a pastoral lease for merino sheep and wool.

The island today is a wildlife conservation park under the management of the South Australian Department of Environment and Natural Resources.

St Peter Island was first recorded and named by Pieter Nuyts and Captain Francois Thyssen aboard the *Golden Leopard* sailing ship in 1627. Unconfirmed legend has it that it was this island where Jonathan Swift's fictional character "Gulliver" met the tiny people of Lilliput.

On 7 February 1802, Matthew Flinders anchored the *Investigator* near St Peter Island and parties were sent ashore, finding huge cliff faces, rocky outcrops, reefs, and exposed ocean beaches to sheltered mangrove-fringed tidal flats.

The IOTA DX group, VK5ISL, also landed about 300 m east from where our

early explorers landed, as this is the only place suitable for beach landings. The island today is in superb condition with low scrub bush vegetation and wild grasses, and a few narrow beaches.

I received two reports from the DXpeditioners and their activity which took place from 26 to 31 March 1997. Expedition leader, Mal VK6LC, a veteran of many island activities around Australia, writes:

"This expedition had more personnel than usual, because it was also a great real-life training exercise. It was a challenge to convert a group of 80 m chit-chat amateurs into proper DX operators. "Everything came together very well.

The first two days were extremely hectic, what with the long distance drive, the loading and unloading of two tonnes of equipment, the sea voyage (two trips), the long hours establishing the camp and equipment, and finally determining the rostered operating shifts.

"Conditions were very good from 26 to 28 March. All the bands had some life, although I would say 40 m had the best activity, opening up to all paths as early as 1500 UTC and still being alive at 2300 UTC, 9.30 am local time in the morning. This was about the time when John, our "chef", champion fisherman and logistics co-ordinator had caught and cooked our fresh fish breakfast which he sometimes served with "Vegemite".

"Twenty and 15 metres were very patchy, but openings were there everyday. We shared equal propagation paths to Europe as well as to North America. The "trainee" members of the team also had a "ball" working VK/ZL on 80 m each night, and working around Asia and the Pacific on 15 m at other times.

"I am very happy now. The 20 and 40 m 4-Square arrays ran "red hot". One of the major problems in achieving

maximum performance from these verticals is to be able to balance out the differential ground radiation resistance, as every island beach has a different mixture of sand which results in different sand resistance. This plays a major part in equalising the RF voltage at each element. The 4-Square configuration of my experiments has now been used for the third time and proved to be very successful."

The island DXpeditioners were Mal VK6LC the team manager, Neville VK5WG, Terry VK5LED, Paul VK5MAP and John, a VK5 SWL who looked after the needs of the group.

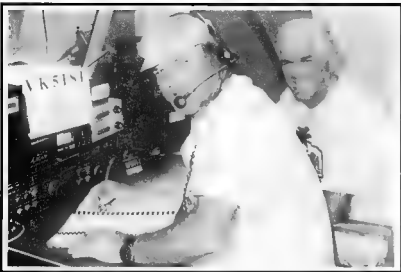
Neville VK5WG, who experienced his first Island DX activity, reported as follows:

"... for the road trip to Ceduna, and then the 14 km boat trip to the island, all equipment and supplies had to be weighed, sealed and branded in containers (to be carried by one person) to meet the total weight limit of two tonnes.

"The beach landings were completed by late afternoon on Wednesday, 26 March without any problems and all equipment was laid out on tarpaulins. Mal, being very focused on the job at hand, had us on the boil, erecting tents, and laying cables (control cables, power cables for lighting and operation). But, most importantly, the assembly of the 20 m 4-Square array with its 160 ground radials.

"Around midnight South Australian summer time all systems were ready to go and the 20 m station was fired up and tested. After the first calls all hell broke loose; we were faced with a dog-pile of IOTA chasers. Logging continued until the very early hours, when propagation was lost on 20 metres.

"On day two, Thursday morning, the 40 m 4-Square array, the four element 15 m Yagi and a 80 m inverted V were all assembled and erected. During daylight hours, with poor or no propagation, we spent our time in checking and cleaning our equipment. Mal conducted a lot of tests and checks on the 4-Square arrays to ensure their efficiency. Paul VK5MAP operated the 15 and 80 m stations, and Mal VK6LC, Neville VK5WG and Terry VK5LED operated the 20 and 40 m station. John, the VK5 SWL cooked all



(l to r) Mal VK6LC, the DXpedition leader, and Neville VK5WG in the operating tent of VK6ISL.

the meals and supplied us with never-ending cups of coffee and toasted hot cross buns.

"Operations ceased in the early hours of Tuesday morning. By early afternoon we were all safely back in Ceduna on the mainland with trailer and cars fully loaded again for the trip home.

"From this DXpedition we, the VK5s, learned some valuable lessons and gained a wealth of experience from Mal."

As usual, Mal included a few interesting statistical notes. The total two wheel drive distance travelled was 5400 kilometres, and the total sea distance was 56 kilometres. 160 litres of Super fuel for

the two petrol generators was used and the party consumed 165 litres of water. The total weight carried was 2,000 kg.

Although total expedition time was seven days, there were only three operational days. Total QSOs on all bands was 2,200. 98 DXCC countries were worked, and they had contacts with 61 IOTA islands.

If you contacted the St Peter Island DXpedition and need a QSL card, QSL direct (with return postage and envelope) to the QSL Manager, Gianni Vareto 11HYW, PO Box 1, 10060 Pancalieri, Italy.

*PO Box 93, Dural NSW 2158

QSP News

Electromagnetic Compatibility Society of Australia

Eric Buggee VK3AX advises that efforts are currently being made to form an EMC Society of Australia.

At present there is no single professional forum representing the discipline of EMC engineering. It is felt that a need may exist for an EMC society due to the increasing implementation of EMC regulations

and limited tertiary tuition in the area at undergraduate level. A proposed charter providing for conventions, publications and support for a range of specialists and local interests has been devised.

If you would like to register interest in the EMC Society, or would like to become actively involved in its formation, please contact either Eric Buggee or Kingsley McRae at RFI Industries Pty Ltd on 03 9762 6733, or fax 03 9762 8501.

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■ Technical

Technical Abstracts

Gil Sones VK3AUI*

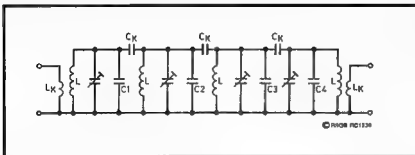


Fig 1 - Four section bandpass filter.

Minimum Loss Bandpass Filters

In the January and April 1997 issues of *RadCom*, Pat Hawker G3VA, in his *Technical Topics* column features some interesting receiver filters designed and constructed by Dick Rollema PA0SE. These filters originally appeared in *Electron* for October 1996.

The filters are Cohn minimum loss designs and the alignment method of Milton Dishal, originally published in *Electrical Communications*, June 1952, is shown.

The filter type is named after the original work, by Seymour B Cohn of Stanford Research Institute, "Dissipation Loss in Multiple Coupled Resonator Filters", *Proc IRE*, August

1959. Further work is given in "Design of Minimum Loss Bandpass Filters" by Jesse Taub in *The Microwave Journal* for November 1963, and an earlier article in *Proc IRE* for May 1957 by Taub and Bogner.

The circuit diagram of PA0SE's four section filter, which is based on the Cohn minimum loss approach, is given in Fig 1. The filter is top coupled by small capacitors, and the coils have minimum self capacitance and mutual coupling. The coil and capacitor details are shown in Table 1.

Alignment is shown in Fig 2. This is self explanatory and uses an RF millivoltmeter and a temporary earth. The steps involve tuning for maximum and minimum as shown in Fig 2. An alternative to the earth is to detune the

resonators temporarily. The RF millivoltmeter must be very lightly coupled so as to have very little effect on tuning. PA0SE found that the filter response obtained by this tuning method could not be significantly improved upon by using sweep methods.

The 0.25 mm wire used for 160 m is enamelled copper wire and the 0.6 mm wire used for all other coils is polyurethane coated copper wire.

Dirty Switch Effect

In *Technical Topics* in *RadCom* for March 1997, Pat Hawker G3VA mentions the "Dirty Switch Effect" in a contribution from Jakey Gould G3JKY. This is the effect in old equipment whereby normal operation can be restored by rotating a switch back and forth. This often occurs with the wave-change switch. The cause is contact oxidation and often cleaning fluids are used to reduce the problem.

A solution is outlined where a small DC current is made to flow through the contacts to overcome the effect. This is shown in Fig 3. This technique is known as contact wetting. It was well known to telephone engineers in the past when telephone exchanges used banks of relays and rotary switches.

A small current is all that is required and it is only necessary in circuits carrying signals where DC is not normally present. The resistors used should be of a high enough resistance so as not to affect the circuit operation.

Noise Sources

A noise source is used when measuring noise figure, or as an

Table 1

Band	Core	Wire	Turns	L_k	L	Q	R	Cres	C1,C4	C2,C3	C _k	Loss	Bandwidth
m	toroid	mm		turns	μ H		k	pF	pF	pF	pF	dB	kHz
160	68-2	0.25	100	5	54.5	178	25.8	131	129.1	125.8	3.3	4.0	66
80	68-2	0.355	60	6	19.4	217	6.41	97.8	91	84.2	6.8	1.2	408
40	68-6	0.6	34	2	5.72	282	15	89	87.5	86	1.5	4.0	184
30	68-6	0.6	35	2	5.74	241	22	43	42.3	41.6	0.68	4.0	226
20	50-6	0.6	25	2	2.67	240	12	47	46	45	1.0	3.0	510
17	50-10	0.6	25	2	2.08	194	10.7	37	36	35.2	0.82	4.0	458
15	50-10	0.6	20	2	1.43	193	7.49	39.2	38.2	37.2	1.0	3.5	653
12	50-10	0.6	16	2	0.973	187	5.31	41.7	40.6	39.4	1.2	2.5	947
10	50-10	0.6	16	3	0.973	170	3.68	28.5	30.6	29.1	1.5	2.2	2198

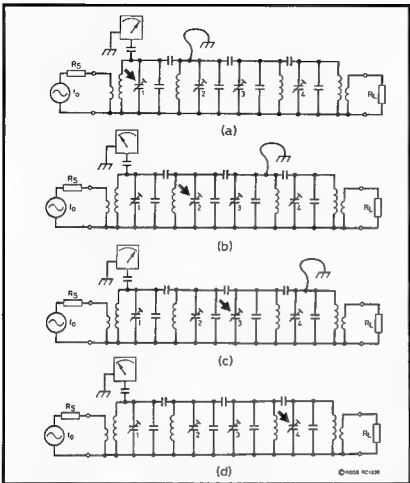


Fig 2 - Maximum/minimum alignment method.

alignment aid for low noise preamplifiers. There are commercial calibrated sources and noise figure meters, but they are quite expensive. Occasionally they find their way onto the surplus market. However, a noise source

can be built and can be calibrated. There are also details of alignment aids which use a noise source.

In QEX for November 1996, Paul Wade N1BWT describes a number of noise sources and their use. Calibration can be carried out by comparison with a known source or device, and mention is also made of techniques to use sun and sky noise for calibration.

The first noise source described was built on an SMA connector and used the base emitter junction of a silicon NPN RF transistor. The transistor used was an NEC 68119. Chip resistors and capacitors were used. A surplus coaxial attenuator was used on the output to improve the return loss.

Low noise preamplifiers are very sensitive to the VSWR or return loss of the noise source. The circuit of the noise

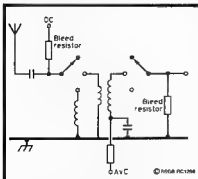


Fig 3 - Provision of DC wetting current

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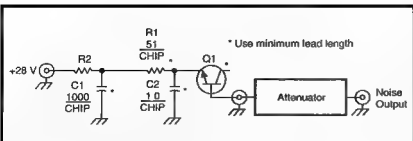


Fig 4 - Noise source built on SMA connector.

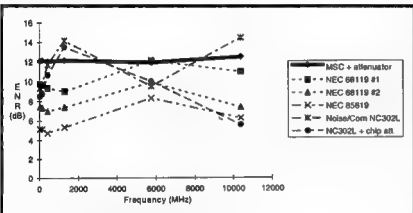


Fig 5 - ENR performance of noise source of Fig 4.

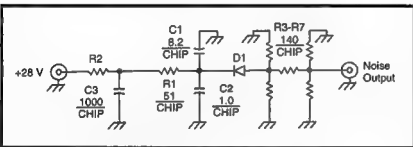


Fig 6 - Noise source using noise diode and chip attenuator

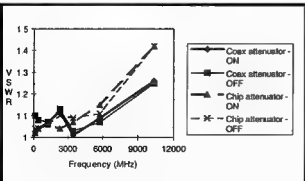


Fig 7 - VSWR performance of noise sources

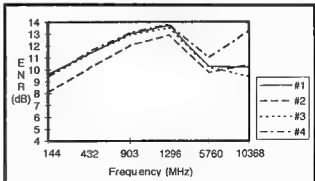


Fig 8 - ENR of several PCB noise source units compared.

source is shown in Fig 4. R2 is selected to set the current for best noise output at the highest frequency of interest. The minimum value of R2 is around 1 kilohms. The performance of this noise source with several different transistors and noise diodes is shown in Fig 5.

The second noise source used a noise diode which was a Noise/Com NC302L on a PCB stripline with a chip resistor attenuator. The circuit of this noise source is shown in Fig 6. R2 is adjusted on test for best noise performance. The VSWR performance of both noise sources is shown in Fig 7. The ENR performance is shown in Fig 8.

QEX is the ARRL experimenters' newsletter. If you wish to obtain it, Daycom Communications Pty Ltd have copies and could assist in obtaining it.

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■ Events

New Zealand ARDF National Championships

Mark Diggins VK3JMD* reports on the recent ARDF fun in New Zealand

Easter this year saw the first New Zealand ARDF event take place in Christchurch. This event, while being their National Championships, was also open to other countries in a friendship section.

A total of 12 competitors from Korea, Australia and New Zealand competed in both the 2 m and 80 m competitions. Representing Australia were Jason VK4YOL, Mark VK3JMD and Sue VK3LSL, while Ron VK4BRG was there as an official referee.

The opening ceremony was held on Easter Friday with practice on the Saturday morning. The 2 m competition was held at Spencer Park, a short drive north of Christchurch, on Saturday afternoon in fine and sunny conditions. The vicious starting corridor (overseen by Ron VK4BRG and Max ZL2MAX) brought competitors to the edge of a pine forest where the five transmitters were hidden. Navigation was difficult due to the dense forest but the terrain was mainly flat. The shortest route was approximately 4 km from start to finish by hunting the transmitters in order from one to five.

The hidden transmitters were on 144.7 MHz with the homing beacon being on 146.0 MHz. The transmitters were sequenced to come on in order for one minute each with constant carrier and keyed FM Morse identification.

The winner in the senior section was Bae HL5JVC, with Mark VK3JMD second and Jason VK4YOL, with a sprint to the finish, in third place. In the YL section, Anne ZL3VR won from Margaret ZL3UD, with Denise ZL3TDW in third place.

That evening we were informed that only two of the 80 m transmitters were working but, by the next morning, a dedicated team of organisers had all the transmitters going.

A late change in venue saw the 80 m competition being held at Spencer Park

also, but this time the weather was cloudy and cool. The start corridor from the 2 m event was used as the finish corridor for the 80 m event. The distance on this event was over 5 km and the winner of the senior section was Mark VK3JMD, with Bae HL5JVC second and Kim DS1CJIK third.

In the YL section, first place went to

Sue VK3LSL, with Denise ZL3TDW second and Margaret ZL3UD third.

The championships concluded with dinner for the participants, referees and organisers, and the award ceremony. All participants were awarded certificates with the New Zealand place-getters being awarded medals.

Mark VK3JMD was the aggregate winner of the senior section together with Denise ZL3TDW who won the YL section.

The night finished with the traditional exchanging of small presents and a group photo. Many thanks to the hardworking organisers from North Canterbury who ensured the championships were a success.

*134 Howard Road, Dingles VIC 3172



The VK ARDF team after presentation of the certificates. (l to r) Ron Graham VK4BRG, Sue Diggins VK3LSL, Mark Diggins VK3JMD and Jason Morris VK4YOL.

VHF Competition Results – Senior Section

Place	Name	Callsign	Txs	Time
1st	Bae Jong Hun	HL5JVC	5	0 40.30
2nd	Mark Diggins	VK3JMD	5	0 44.40
3rd	Jason Morris	VK3YOL	5	0 59.30
4th	Hwang Hyu Hwan			0 59.40
5th	Andrew King	ZL2UKF	5	1 37.00
6th	Kim Jong Mo	DS1CJIK	4	1 01.05
7th	Ron Godkin	ZL3TO	1	2 11.14

YL Section

1st	Anne McMaster	ZL3VR	4	1 31.30
2nd	Margaret McConnachie	ZL3UD	4	1 32.20
3rd	Denise Hider	ZL3TDW	3	2 02.35
4th	Sue Diggins	VK3LSL	1	1 31.50

HF Competition Results – Senior Section

1st	Mark Diggins	VK3JMD	5	1 03.25
2nd	Bae Jong Hun	HL5JVC	5	1 17.10
3rd	Kim Jong Mo	DS1CJIK	5	1 22.30
4th	Shin Sang Hee	DS5ANY	4	2 09.25
5th	Hwang Hyu Hwan		3	1 49.20
6th	Jason Morris	VK3YOL	3	1 55.20

YL Section

1st	Sue Diggins	VK3LSL	4	1 35.20
2nd	Denise Hider	ZL3TDW	4	2 12.40
3rd	Margaret McConnachie	ZL3UD	3	2 05.30
4th	Anne McMaster	ZL3VR	2	1 29.00

WIA Federal 1996 Annual Reports

Here are précis versions of those 1996 Annual Reports adopted by the Federal Council of the WIA at the 1997 Annual Federal Convention and approved for publication.

Federal President

1996 was a year in which the Company sustained a major loss of funds, which was overshadowed all other activities. Major factors contributing to the loss were declining membership, and a Council motion to reduce the Federal component of the subscription (including G grade) by \$5.00. Most Divisions chose to absorb the \$5 into Divisional funds. In addition, the *Amateur Radio* apportionment was way below the actual cost of *Amateur Radio*.

The Office Manager, Donna Reilly, resigned to take up full time employment elsewhere and was not replaced. Her duties were devolved to the Book-keeper June Fox, the Auditor, the Company Secretary and the President. Some financial resources were saved, but not to the extent first envisaged. Whereas the Office Manager made the necessary day-to-day decisions, these had to be passed to the Secretary or President.

Divisions were asked to make a concerted effort to arrest the membership decline. Some Divisions did, and the monthly list of new members increased slightly. One Division invited approximately 1000 non-members to join, with a mail-out of material informing them of the WIA and its activities, etc. A 2.2 % success rate was achieved. Perhaps when the telephone companies start charging the Internet customers for timed

local calls some of them may turn to amateur radio.

An invitation to attend the ARDF function in Townsville was accepted. This activity was reported in *Amateur Radio* magazine, along with photographs, but could not convey the enthusiasm of the organisers and participants. The opportunity to meet and discuss amateur radio with two Directors of Region 3 and Chen Ping BAIHAM, Secretary CRSA, was opportune with the Region 3 meeting due later this year. Also attending the opening day of the ARDF activities were two members of Parliament. Both expressed their knowledge of our "Submission on Licensing" and a desire to assist the WIA.

The office staff continue to perform their duties well, particularly with the burden of not having an Office Manager/Secretary. Industry terminology is "resource re-balancing". Hopefully, the discussion regarding budget, staffing, etc, will give a clear picture of our future.

Neil Penfold, VK6NE
WIA Federal President

Federal Secretary

1996 has been a difficult year for the WIA. Membership levels were again down compared with the previous year. Income from advertising in *Amateur Radio* continued at a lower than desirable level. At the same time the costs associated with providing services to members did not reduce in the same proportion. The net result was an end-of-year deficit which has been met out of reserves.

Certain measures were proposed to Federal Council during the October Extraordinary Convention of Council which were aimed at reducing administration costs. These included a move to common renewal date for membership subscriptions and the out-sourcing of the production and supply of *Amateur Radio* magazine. Both of these measures were implemented from the beginning of 1997 and it is expected that cost savings in the operation of the Federal Secretariat in Melbourne will result. Inevitably, the transition period between cyclic billing dates and a common renewal date will cause some disruption and short term inconvenience, but by 1998 most of the problems should have been resolved.

During 1997, there will be a number of important overseas meetings to which the WIA will send expert representatives. These include the Region 3 IARU meeting in Beijing and an ITU-R meeting in Geneva. Funding for attendance at both of these events has been budgeted from WIA Federal financial resources.

A significant staffing change in the Federal Secretariat occurred during 1996 with the departure of our Office Manager, Ms Donna Reilly, who resigned to take up employment elsewhere.

The staff at the Secretariat in Melbourne continue to provide professional services to the Federal Executive and Council and their loyal and dedicated support is much appreciated. We rely on their proven capabilities in the day-to-day administration of our business activities affairs.

Peter Naish VK2BPN
Federal Secretary

AMSAT-Australia

This year has seen the loss of AMSAT-OSCAR-13 (AO-13) one of two highly elliptical orbit Amateur Satellites with a fiery re-entry into the earth's atmosphere in December. However, this year has also seen the successful launch of two new low earth orbit (LEO) Amateur Satellites, the Japanese satellite, JAS-2, 'Fuji OSCAR-29' on 17 August 1996 and the Mexican satellite, UNAMSAT B, Mexico-OSCAR-30 on 5 September 1996.

In December 1995 I was appointed by Hans van de Groenendaal the IARU Satellite Advisor as the IARU AMSAT Frequency Co-ordinator. This has involved attempting to co-ordinate the allocation of Amateur Satellite frequencies in the three IARU regions which have quite different band-plans, particularly in the 2 m band. The most perplexing problem has been trying to find 2 m frequencies acceptable in all three regions for use of Amateur Radio on-board Space Shuttle missions, the Soviet Space Station, MIR and the future International Space Station. To date I have been unsuccessful and, in October 1996, at the IARU Region 1 Conference in Tel Aviv, Israel recommended an uplink of 145.2 MHz and a downlink of 145.8 MHz which fits within the Region 1 VHF band-plan but not in Regions 2 and 3.

In this role I was fortunate enough to attend the AMSAT-UK Colloquium in July (funded by the IARU) and had the opportunity to discuss international Amateur Satellite issues with representatives from 17 countries and all continents. At this conference I presented a paper on analysing AO-13 telemetry and another prepared by Ed Krome on suggestions for Phase-3D ground-station configurations. I also chaired a meeting on Amateur Satellite frequency co-ordination issues.

Other milestones in 1996 were the launch of the Spartan Packet Radio Experiment (SPRE) on Space Shuttle mission STS-72. This experiment was designed to test satellite tracking using Amateur Packet Radio and the Global Positioning System (GPS). Another milestone was the activation of the German SATEX II 70 cm repeater on-board the Soviet Space Station MIR.

The International Phase-3D Project progressed well in 1996 with the launch now slated on the European Space Agencies (ESA) Ariane 502 launch in July 1997. This project is the most complex Amateur Radio Satellite project to date with transponders covering frequencies from 29 MHz to 10 GHz. Phase-3D will also be in a highly elliptical orbit similar to AMSAT-OSCAR-10 and 13 but, unlike those earlier Phase-3 satellites, Phase-3D will have a 3-axis stabilisation system that will maintain the antennas pointed towards the centre of the earth throughout the entire orbit, meaning much better communication opportunities.

As proposed in last year's annual report, I did attend the Phase-3D Orbit/Mission Analysis and Command Station Meeting held in Marburg, Germany in May 1996. To maximise the benefit of this trip I visited both the Dayton Hamvention, Ohio and the Phase-3D Integration Facility in Orlando, Florida on the return journey. At Dayton,

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I presented a report on the Marburg meeting and in Orlando I had the opportunity for the first time to view the Phase-3D spacecraft and to help set up the laboratory's command station hardware and software. This trip was funded by the Wireless Institute of Australia as its contribution to the Phase-3D Project.

Thanks again to Bill Magnusson VK3JT who has again continued to keep the readers of the *Amateur Radio* journal up to date with his timely AMSAT-Australia column in spite of having moved house during the year. Bill's effort continues to encourage newcomers into the area of the Amateur Satellite Service. In 1996, I received less than 300 requests for information on the Amateur Satellite Service via Australia Post but received over 400 e-mail requests. Similarly, with the wide-spread use of packet radio and the Internet for information dissemination, the number of subscribers to the AMSAT-Australia monthly NEWSLETTER has fallen to under 200, the lowest in five years!

Finally, I would like to thank the WIA for its continued support of the Amateur Satellite Service via the activities of AMSAT-Australia and ask that the 1997 Federal Convention recommend that the WIA continue to support AMSAT-Australia financially at the present level.

Graham Ratcliff VK3AGR
AMSAT-Australia National Co-ordinator

Awards

A general discussion on the relative prestige values of the WIA DXCC and that of the ARRL boiled down to a matter of costs. Our entry in the DXCC race costs a maximum of five dollars (free to WIA members), while the US counterpart can cost up to \$US75.00. I continue to push our own product here and overseas. The safe return of precious QSL cards can also be a problem from the other institution.

Overall, I have not encountered any serious problems. A short conversation with some of my associates generally smoothed out anything which had arisen.

John Kelleher VK3DP
Federal Awards Manager

Contents Introduction

The five official WIA contests are managed by the following people:

John Martin VK3KWA Ross Hull Memorial Contest
Phil Raynor VK1PJ- John Moyle Field Day
Ray Miliken VK2SRM VK Novice
Aleks Petkovic VK6APK RD Contest
Myself, VK/ZL/Oceania DX Contest

There have been no changes to the contest management line-up since last year, and I wish to thank the managers of the first four contests for their excellent efforts. Some brief notes on each contest, listed according to their position in the calendar, appear below.

Ross Hull Contest

After a three year trial period, it appears that the "best 100" scoring method might not be stimulating activity as expected, and has not relieved the pressure on entrants to spend large amounts of time in the shack. Also, a demand for 6 m operation has resurfaced, so it appears that some innovative thinking will be needed before the rules are finalised for next year's event.

John Moyle Field Day

Last year, the manager (Phil Raynor VK1PJ) mentioned in *Amateur Radio* that he was considering a revision of the operating times for the 1997 event. This resulted in a flurry of letters to both Phil and myself, and as it quickly became obvious that the changes would inconvenience many people, plans to revise the times were dropped. Given the fact that the ideal start and finish times differ so much across the continent, and to allow entrants more time to drive to their destinations, set up and dismantle, I believe we should be seriously considering moving the contest to a long weekend, or perhaps the Christmas holiday period. Entrants would be less rushed, able to set up more ambitious stations, and would commence the contest in a more refreshed condition. It is significant that the Northern hemisphere field days are scheduled for holiday periods. Comments from members are invited.

Novice & RD Contests

These are both running very smoothly, and no changes are envisaged for the coming year.

VK/ZL/Oceania DX Contest

Following a survey of the 1995 contest, and discussions with entrants and the co-manager John Litten ZL1AAS of NZART, it was decided to drop 160 m from the 1996 event. This change was well received by entrants, and activity on the higher bands was noticeably more intense, so the change has been made permanent.

160 m Contest

Following the loss of 160 m from the VK/ZL/Oceania DX Contest, and to accommodate the many keen 160 m enthusiasts in VK and ZL who previously had no contest in which to test their stations and operating skills, a new 160 m contest was started last July in consultation with John Litten ZL1AAS. Over a hundred stations took part, including DX stations as far away as the USA, so it has been decided to make this an annual event. The new VK manager is Ian Dodson VK3DID, who has prior experience running the Annual QRP Day Contest, and who will share management duties with ZL1AAS, in much the same way as the VK/ZL/Oceania DX Contest is managed. Official WIA recognition of this contest is currently being sought.

Contest Certificates

Last year, Council decided that the preparation and mailing of contest certificates would be no longer performed by Federal Office staff, but devolved to the individual contest managers. Unfortunately, this change has caused some problems, including the inability to double-check the list of winners and correct any errors before certificates are mailed, occasional long time delays before winners receive their certificates, a much greater burden of work on our contest managers, and the loss of the organisational skills of Federal Office staff.

This change has a major impact on our two biggest contests (the RD and the VK/ZL), which involve a huge amount of work for the relevant managers before the extra burden of certificates is even considered. The loss of Federal Office support is sorely missed, and it is hoped that the previous system will be restored as soon as possible. In the meantime, members are asked to be patient, and to advise the relevant contest manager if they fail to receive a certificate as

expected, or if they notice some other anomaly. I would like to take this opportunity to thank the Federal Office staff for their excellent support with contest awards over the last few years.

Several proposals relating to contests have been put before Council, and are summarised below.

1. Contest entrants are required to declare that they have operated "in accordance with the spirit of the contest". Unfortunately, this spirit has never been defined, and an ad-hoc definition would probably not survive a determined legal challenge. To close this loophole and allow contest managers more discretion in sanctioning entrants when warranted (ie if they act poorly or unethically), it is proposed that the essence of good amateur behaviour be defined in an Amateur's Code of Ethics, and promulgated through *Amateur Radio* and the *Call Book*.

2. Virtually all overseas countries offer a variety of special prefixes to their amateurs, usually for contests, but just as often for normal use. Australia and New Zealand are amongst the very few remaining countries which retain a rigid and old-fashioned approach to callsigns. To heighten overseas interest and activity in our premier international contest (VK/ZL/Oceania DX), it is proposed that permission to use the V1 and/or AX prefixes be sought for the phone and CW weekends of this contest, and the week in between.

3. The VHF/UHF Field Day and 160 m contests are unique, and satisfy significant sections of WIA membership. To ensure their stability, longevity and proper promotion, it is proposed that they be added to the list of official WIA contests. As relatively few certificates are offered, and the 160 m contest is shared with NZART (who have already added it to their official list), the impact on WIA resources will be minimal.

Peter Nesbit VK3APN
Federal Contest Co-ordinator

Education

Early in 1996 the Question Bank committee decided that we had progressed as far as we could for the time and the Committee was disbanded at the request of the members.

By that time it had prepared all three question banks and submitted them to the SMA. Discussions with the SMA had been held on all syllabuses, but no final agreements had been reached by the end of the year. Most of the year has been spent waiting for the SMA to consider the submissions.

In July the SMA agreed that the Regulations question papers should be reviewed. This was held up to some extent by my health problem and also by the later request from the SMA that all questions on the papers be presented in the current terminology.

By the end of the year, the first set of five papers was almost ready for final approval, and the next five were partly revised.

The Examinations Committee has met several times to consider SMA comments, to respond to correspondence relating to examinations, to discuss examination questions or procedures, and to formulate policy.

It is pleasing that action has at last been taken on the revision of the SMA brochures. Drafts were received late in the year and comments prepared.

I would like to bring to the notice of the Council the fact that the number of candidates for examinations is dropping steadily. Between 1992 and 1995, the number has more than halved.

Admittedly, in some subjects the pass rate has increased slightly, but it is clear that the demand for examinations is decreasing, which means that the rate of recruiting of newcomers to the hobby has decreased.

If amateur radio is to remain as a viable interest in Australia, it is time for a concerted campaign to sell amateur radio to the public. The WIA can recruit members only from licensed operators. If there are too few new operators coming in, then the WIA is on the way out even if all new licensees become members.

In 1996 I provided publicity materials to three conferences of science teachers. There is room for an active campaign to target not only science teachers but also humanities teachers. The full potential for the use of amateur radio in Australian schools has not been explored. This may be where we need to seek our continuing recruitment from the younger generations.

Brenda M Edmonds VK3KT
Federal Education Co-ordinator

IARU Liaison

Region 3 IARU activities ANDR

Australia was privileged to host the second Region 3 ARDF Championships which were held in Townsville in July 1996.

These Championships were a great success with 110 participants from nine IARU societies.

Our thanks must go to the team of enthusiastic helpers who contributed to the success of the event.

Other Matters

Apart from ARDF there was little activity from Region 3 IARU during 1996. However, things will be very different in 1997 with the Tenth IARU Region 3 Conference to be held in Beijing China from 8 to 12 September.

Preparation for the conference is well underway with draft papers under preparation for discussion before forwarding to the conference.

International Secretariat and Administrative Council Matters

Future of the Amateur Service Committee

The FASC committee, set up by the President of the IARU, has the task of giving guidance to the IARU in developing a position on any changes that would be desirable to article S25 of the ITU Radio Regulations titled the amateur and amateur-satellite services.

The International Secretariat of the IARU distributed the first draft report of the Future of the Amateur Service Committee early in the year. The WIA, after consultation, submitted a reply covering its views on this draft.

A further report has now come out, taking into account the comments on the first draft received from member societies. A working group consisting of David Wardlaw VK3ADW, Grant Wilks VK5ZWI and Brenda Edmonds VK3KT is studying the report in order to assist the council develop the WIA position. The widest consultation possible will take place.

The working group were lucky to be able to invite Michael Owen VK3KL, the chairman of the FASC committee, along to a meeting to impart his ideas to us. The work of the FASC is very important to the amateur services as WRC 99 has a review of article S25 of the Radio Regulations on its agenda. Article S25 is the article that deals specifically with the operation of the amateur and amateur-satellite services.

It is essential that we get it right as, due to the pressures caused by the size of conference agendas, it is unlikely that a review of S25 could possibly appear on the agenda of another WRC for many years.

7 MHz Strategy Committee

A comprehensive report was received by the IARU Administrative Council and an approved action plan has been distributed to member societies. This is also very important as harmonisation between the amateur and broadcasting services at 7 MHz will be on the agenda for WRC-99.

The Strategic Plan for the Development of Amateur Radio

The Strategic Plan for the Development of Amateur Radio was updated by the Administrative Council.

IARU Region 3 Conference

This is the second of the triennial conferences of the IARU's three regional organisations to be held since the draft agenda of WRC-99 was determined.

As WRC-99 has on its agenda items vital to the amateur services, the conference will have to make decisions vital to the long term future of the amateur services. This conference will give the opportunity for the WIA to contribute to the debate on these matters.

WRC matters are not the only subjects that will

be covered by the extensive agenda for the conference. A number of IARU policy resolutions will need to be updated. For example the resolution concerning digital modes. The Asian Pacific Telecommunity will be increasing its involvement in the development in harmonisation of the proposals of Region 3 countries to WRCs. The IARU must monitor the situation and become involved if at all possible. Promotion of amateur radio in developing countries policies will need reviewing.

David Wardlaw VK3ADW
IARU Co-ordinator

International Amateur Radio Union Monitoring Service

The year closed with a much lower number of intrusions, mainly caused by the adverse propagation and not by any lessening of the illegal operations into our recognised bands. On the whole, the very poor conditions on 40 and 20 m have curtailed amateur operations, but not those of the intruding stations, who run much more power, and also in most cases blanket the world from many transmitting sites.

40 m. This band has been dominated by CIS transmissions, modes used being R7B, A1A, and the ever-present Single Letter Beacons (SLB) of the Russian Navy. An occasional broadcast station relieves the monotony with its fundamental or second harmonic (C2H).

We have had a breakthrough with Radio Taipei. A 7.080 "spur" of 7.105 MHz has been removed by the direct action of Col VK4AKX to the Technical Engineer of Radio Taipei. This type of direct action must be applauded and is finding favour with most IARUMS Co-ordinators - it does work!

20 m. Again CIS, SLBs, F1B, NON 6 POH, A1A, and 89W modes predominate across the whole band, with an odd J3 & A3 transmission just to even up the selection. VRQ left the scene during the year; this cut down the number of reports by about 50-plus observations a month.

15m. North Korea seems to have dominated the band, with good propagation permitted. Mainly A1A signals; 21.114 MHz comes to mind - "P8M de P7A" can be heard often. China also with "B6P" sends CQ and traffic. Many carriers can be heard - these are mode NON.

On the WARC bands most intrusions seem to be in the 10 and 18 MHz segments. 18.075 and 18.155 MHz are the most popular frequencies, mainly from the Indian region, radio telephone links and military radio stations.

The only Intruder Watch Net appears to be conducted by Tom VK4BTW on 3578 kHz +/- QRM on Fridays at 0700 UTC. Tom is the VK4 State co-ordinator and is doing a great job. I would like to see the other states running a similar net, at Club level would be ideal.

"TT page 848" on the packet BBS's is being trailed, with monthly updates from the VK1W Co-ordinator ensuring new information, etc.

Conclusions. The MS definitely needs MORE observers, as most of those doing this IMPORTANT side of amateur radio are getting past their "use-by" date. Some are having serious health problems. VK4 lost another of its

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foundation members of IW, Ron Glassop VK4BG became a SK during the year. No younger person has seen fit to fill the gap.

The younger generation of amateurs, and maybe the not so young, seem to suddenly get COLD FEET when asked to spend a minimum of three hours a week to help protect our bands from illegal intrusions in VK. Maybe we should give a prize or have a contest? There is hardly a week that I do not receive at least one phone call about an intrusion. Where possible I follow this up with information, but it is rare to get a new observer for my trouble. Therefore, it seems to me that amateur radio is not worth the trouble of working for by the majority of operators. Come on Prove me wrong!

My thanks to those observers and co-ordinators who have taken the time to send in observations during 1996

Gordon Loveday VK4KAL
Federal Intruder Watch Co-ordinator

Publications Committee

Achievements

Probably the most significant achievement of 1996 has been the regular production of *Amateur Radio* each month at a cost which is still much less than any similar technical/house monthly for a total membership of about 6000. The responsibility for production, including production administration, has been devolved, initially for two years, from the Federal body to a contractor. By this means Council has hoped to reduce production cost, or at worst to maintain it constant. It is too soon to say if costs are being reduced, but the successful contractor has a history of efficient management, being none other than Bill Roper VK3BR, the previous production editor, now operating as vk3br Communications Pty Ltd.

Council chose Bill's organisation from a total of five competitors. His contract continues up to the December 1998 issue of *Amateur Radio*. The Publications Committee remains as an interface between the WIA and the production firm and continues to provide editorial services.

Problems

The Publications Committee has been very disappointed in the lack of liaison between Council and the Committee. In particular, there was a total lack of consultation by Council with the Committee before Council unilaterally took action to change the whole production system. Tenders were called without consultation with the Committee which could have advised in detail as to the requirements. The contractor was appointed to administer, produce, print, and deliver the magazine, again without consulting the Committee. It is indeed gratifying that the appointment resulting from this haphazard procedure fully meets with the Committee's approval.

Other problems during the year have involved personnel changes. Norm Eyres resigned in June and Bruce Kendall in July, followed by Bob Tait in December. All three had personal or family reasons for leaving. In July the Federal Office Manager, Donna Reilly, also resigned but, since the magazine administration has been "outsourced" this has reduced the additional load on the remaining office staff. Two new candidates,

Don Jackson and Murray Lewis, have offered to join the Committee.

During the year it became apparent that the magazine would even better represent the interests of all Divisions if each Division were to appoint one or more Divisional Sub-Editors, each with the responsibility for providing news and other material regarding activities in his/her Division which might be of wider interest. The Publications Committee would thus become more widely based rather than being perceived as a purely Melbourne group. The present Divisional Broadcast or Publicity Officers fill this role to some extent and there are also some interstate Technical Sub-Editors, but a Divisional Sub-Editor representing the Publications Committee in each State would be a logical improvement.

In conclusion, it is to be hoped that the administrative changes which are being made to the WIA will be successful in reducing costs, and even more desirably in increasing membership numbers. Our magazine *Amateur Radio* will continue to play a large part in these efforts.

Bill Roper VK3BR
Editor

VK0/9 QSL Bureau

1996 saw an increase in visiting overseas amateurs to our island territories. However, no correspondence or instructions were received as to the forwarding of their Bureau cards. So many cards are returned as "Unclaimed from the Bureau".

Some time ago the first letter of the suffix was agreed between the SMA and the WIA to indicate the geographic location of the VK9 operator. This no longer takes place. It was also agreed that visitors being granted a VK9/0 call sign would have it endorsed "For operation within Australia and Territories". This came about because the VK9/0 call signs were being used as portable stations by non-VK operators around the world. The latest is VK9XL, using this call sign in the R0 area. He holds his own call sign of UA0ZDA with a home address in Sebastopol, Russia. Is this another issue for the SMA/WIA Liaison committee to address?

All other activities of the Bureau have functioned normally during 1996.

Neil Penfold, VK6NE
ar

QSP News



First New WIA Membership Prize Awarded

The first winner of a \$195 Fluke 12B digital multimeter in the WIA's 1997 Recruit a Member campaign was Mike Ramsay VK2VZQ.

As Mike is a shift worker, it was difficult to find a time which was convenient to both himself and the WIA. However, Mike came to

Amateur Radio House on Sunday, 6 April for the presentation, which was held during one of the Divisional Trash and Treasure Sales. Rumour has it that the new Fluke multimeter was not the only treasure Mike took home with him!

The presentation was made by the then Divisional President Peter Jensen VK2AQJ - he's the one with the beard!

Eric Fossey VK2EFY

ALARA

Sally Grathidge VK4SHE*, ALARA Publicity Officer

Congratulations

ALARA's outgoing president, Christine VK5CTY, was presented with life membership of ALARA at a recent luncheon in Adelaide in recognition of her work for ALARA going back eight years. Christine was so overwhelmed she was speechless – for a while anyway!

Mary VK4PZ and OM Gordon VK4GM received Honours Awards from WIAQ for their service to amateur radio. Mary is once again treasurer of the Rockhampton and District Amateur Radio club, as no-one else was willing to do it – sounds like a familiar story.

Sympathy

Sam, OM of Christine WB2YBA, died suddenly in April from a heart attack.

VK4 Net

This net on Friday nights at 0930 UTC on 3.565 kHz +/- has not been well attended lately. State Representative Robyn VK4RL has been working, studying and assisting Lorna (XYL of Ted VK4QI) who is seriously ill, so has not had much spare time. Mary VK4PZ calls when Robyn is not available, so, VK4 YLs and others, please try to be there when you can to keep this net going.

Visiting

Ella GOFIP, BYLARA member, was staying with her brother in Brisbane, and took time to fly to Melbourne to see her sponsor, Gwen VK3DYL. They attended the VK3 April luncheon and a meeting of Gwen's local radio club, the EMDRC, so Ella was able to meet a few VK3 Amateurs.

Choon Taek Cho HLIASD from Korea has been living in Sydney since last October and will be there until June or July. She is sponsored by Kay WA0WOF whom she met at the YL meet in Osaka in 1993. She gained her radio licence in 1983, was president of KLARC (Korean YLs) for many years, and is attending the Nepean Language Centre in western Sydney University learning "English for Academic Purposes". Her OM is HLIALT. The Year 2000 YL meeting will be in Korea.

Stormy Weather

The QTH of June VK4SJ in Caloundra was hit by a severe storm early in the year. They watched the guy wires on one side of the tower break, followed by the whole tower! The tower, rotator and TH6DXX were a write-off, and they have been reduced to

operating on a GSRV while waiting for a replacement.

Sally VK4SHE waited and watched as Cyclone Justin meandered about the Coral sea, and was fortunate that it brought only moderate winds and plenty of rain to her QTH. The road into town was cut for a couple of days, but it was worth it to break the six year drought.

More Fun at Svalbard

This international YLMEET in Norway on 20-24 August 1998 is sounding better and better. Here are some of the things you can do while you are there. Fossil hunting by the Sverdrupen Glacier (hammer and chisel provided), glacier walking (don't forget your fur boots), kayak tour (no experience necessary – life jacket supplied), and dog-sledging on the Foxfenne Glacier (dogs provided). You must register for this meet before December this year.

Jenny's Guides

Jenny Housden and her Guides were unable to take part in the World Wide Thinking Day due to extreme weather, but they are still radio active, and a training day was held in May for Patrol Leaders and Seconds (ages 8-14) building electronic kits. I hope Jenny had plenty of helpers, as she wanted the girls to see that women can do such things as well as men.

More Guides from Clara Clarion

GOTA was a success in spite of the low point in the sun spot cycle. Unfortunately, the British version TDOTA (Thinking Day On The Air) was on a different weekend, but next year both sides of the Atlantic will get together on 21 February 1998. As with JOTA

the Guides love to talk to other Guides, but all stations are welcome to join in and tell the girls about their areas and activities.

Grand Prix

Gwen VK3DYL was part of the team operating VIIIP, the Special Event station run by the EMDRC for the Grand Prix in Melbourne.

Out West

The VK6 YLs hold regular luncheons, and would be delighted to have visiting YLs join them. If you are passing through Perth any time, phone Poppy VK6YF on 2762652.

Helping Out

Vicki VE7DKS devotes much of her time volunteering for the Municipal Emergency Program which deals with disasters like earthquakes, chemical spills, fires, ash falls, train derailments and aeroplane crashes. Vicki started the program as Emergency Social Services Director in the city of Colwood, where she lives, a year ago, and takes care of basic training for the Greater Victoria Area, organising instructors and taking part in communications for community events.

Elettra Marconi

Ruth IT9ESZ, DX correspondent for Elettra Marconi, participated in a DXpedition to Tunisia, with two OMs and a YL from the Czech Republic. This was the first time 3V8BB had been worked by YLs. Ruth is enthusiastic about the Berlin YL World Meet in 1996 and is saving to go to Svalbard.

In September she organised a YL DXpedition to San Marino T70A together with other YLs from her local radio club. Four YL operators spent a pleasant weekend of hard work and fun despite rain fog and thunderstorms.

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The newsletter is published monthly by Graham VK5AGR. Subscription is \$30 for Australia, \$35 for New Zealand and \$40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

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Keplerian Elements

Current keys are available from the Internet by accessing the AMSAT FTP site, <ftp.amsat.org> and following the sub-directories to "KEPS".

Phase-5...What on Earth is That?

A brief history lesson ... pens down and pay attention at the back!

The first amateur radio satellite, OSCAR 1 was launched on 1 Dec 1961. It was very simple. Its battery lasted about three weeks and new satellites followed in quick succession. OSCAR 5 was built at Melbourne University. OSCAR 6 in 1972 ushered in a new era of sophistication. It was the first to have its batteries recharged by solar cells. It was controllable from Earth and it had on-board CPU control. It lasted nearly five years. It was obviously a very different satellite from any of its predecessors. It was dubbed "phase-2" and the "phase-x" system of identification was born. Phase-2 satellites are still being built and launched. JAS-2 falls into this category.

Another leap forward occurred in May

1980. A new orbit, a new concept, phase-3a. Sadly, it failed to reach orbit due to a rocket failure. It wasn't until three years later in June 1983 that we had our first operational phase-3 bird which went on to become OSCAR 10. A little the worse for wear, it is still providing good communications today.

What was different about it to make it a different "phase"? Essentially, it's the orbit. Unlike previous phase-1 and phase-2 amateur radio satellites, OSCAR 10 was in an orbit pioneered by the Russians, a "Molniya" orbit, taking it out in a huge ellipse, some 40,000 km into space. Another new era in amateur radio communication. So now we have phase-1, phase-2 and phase-3 satellites.

In the late 1980s there was some preliminary development done on a proposed geo-stationary amateur radio satellite. It was abandoned due to funding uncertainty. Had it come to fruition it would have been a radical departure from any existing amateur radio satellite and would have been the first "phase-4" bird. There are some who still believe that "geo" is the way to go and that ultimately we will be served by a "constellation" of three interconnected geo-stationary satellites orbiting around the equator. I'll take a closer look at this point next month.

OK so far, but what is all this about a "phase-5" satellite? What could it possibly be? Surely "geo" is about as far as we can go. In strictly amateur radio terms this is probably true but, read on!

Dr Karl Meinzer DJ4ZC quite properly holds the honorary title of "Father of the phase-3 birds". It was Karl who put the concept together and pushed for it in the early days. Now he is on the job again. He has for some time nurtured the idea of an amateur vehicle going off to Mars. It has moved out of the idea stage and into the planning stage. It is not certain yet that it will carry an amateur radio package but it will follow along the lines of phase-3D in design and construction. It will be a scientific satellite and, like the UoSats from University of Surrey it will be a university project.

Last year a "kick-off" meeting was held in Marburg, Germany. At the meeting Karl proposed a vehicle modelled on phase-3D. Its engine would have enough thrust to propel it to Mars and insert it into orbit. The availability of solar energy was discussed. Mars is further from the Sun than Earth and the available solar energy is only half that available in earth orbit.

Communication would require a minimum of a three metre dish. The transponders would use "S" band up, and "X" band down. Tracking would not be easy and the rigorous standards involved would preclude the vast bulk of amateurs from participating directly, but the possibility of a few gateway stations feeding into the packet system or the Internet is still being considered. No doubt there are some among our ranks who would want to be more directly involved.

It's difficult to imagine a greater challenge.

The primary purpose of the project would be to fly university-based scientific experiments to Mars orbit. It could also take part in the transfer of data between Mars land vehicles which NASA has planned, and Earth. Let's watch this project as it matures. If Karl's record is any indication it will be something for amateurs to point to proudly in the future.

MO-30 ... What Happened?

Tom Clark W3IWI recently reported more details on the fate of MEXICO-OSCAR 30 (MO-30). The satellite, which also contained a 40 MHz meteor radar, was built at UNAM (The Autonomous University of Mexico) in Mexico City by David Liberman XEITU and his students. They have had rather bad luck in this project.

The first UNAMSAT was destroyed when its launch vehicle exploded shortly after the lift-off from Plesetsk in March 1995. UNAMSAT-1's spare parts were used to construct a replacement which was launched successfully on a different type of launch vehicle, also from Plesetsk. The new satellite transmitted telemetry for about one day.

Unfortunately, according to Tom, the launcher was very cold. MO-30 separated from the launcher at a temperature of about -30 degrees Celsius because the satellite was under the launcher shroud for a couple of hours. Apparently, the crystal oscillator in the uplink receiver's first local oscillator never started oscillating, so the satellite was totally "dead".

Because there was no functioning uplink, battery charging parameters suitable for the unanticipated cold temperatures could not be loaded, and the satellite ran out of power. Later attempts to revive it were unsuccessful. MO-30 project managers have now concluded that it has been lost, apparently for good.

One feels for the project gang at UNAM and it brings to mind the old adage, "For the want of a nail the shoe was lost, for the want of a shoe the horse was lost, for the want of a horse the rider was lost, for the want of the rider the battle was lost, for the loss of the battle the war was lost." When you consider all the possibilities for similar small

component failures it's remarkable that any of these projects are completely successful. Our sympathy goes to the project people at UNAM, especially in this case as the problem was not within their control.

Oils ain't Oils and Keps ain't Keps

It came to my notice recently when editing a block of kep elements that something was amiss. No matter how hard I tried to get my computer program to accept the keps, it kept telling me that such and such a satellite just wasn't there. To the naked eye it WAS there, right there in the middle of the rest of the keps. No doubt about it, there it was, DOS text doesn't lie... or does it?

I recalled a similar incident on my old faithful BBC Acorn computer some years ago. A closer examination revealed the culprit(s). The name of the satellite in question on line 1 was followed by four (quite invisible) spaces before the <CR>. Delete the spaces, save the file and presto, problem solved.

My program was looking for a satellite called "X" and it kept seeing a satellite called "X<space><space><space><space>" so it put up an error message. I remember agonising over this one back on the BBC. I only found it then because I had to edit the actual name of some weather satellites due to case sensitivity in the software. If you have problems with your computer program accepting some keps, check for trailing spaces after the satellite names. It can still happen. I contacted a CompuServe sysop about a similar occurrence quite recently. He was unaware and most apologetic. I have to say it didn't happen again.

SunSat Latest

Launch is due on 14 August 1997. The satellite was designed and constructed by the students at the University of Stellenbosch. The main command station will be at Stellenbosch and another is planned for Johannesburg. The Johannesburg station will take care of the high-speed data link and the imaging system.

Next Month

Six-monthly satellite status/frequency/mode report. Geo-stat or geo-sync, what's the difference? Exciting news from the Surrey team about some new high speed digital satellites. Rumours abound, but by next month I should have something confirmed regarding baud rates, purpose, orbits and equipment requirements.

*RMB 1627, Midway VIC 3678
E-mail vk3j@amsat.org

RF

Awards

John Kelleher VK3DP - Federal Awards Manager*

Another half-year has gone, and A conditions have not improved greatly. Sunspot figures have risen only marginally. The odd DX station is popping up, providing some relief to those avid DX chasers looking to upgrade their figures. Which reminds me to mention that upgrades must be in before the end of this month, if they are to appear in the DXCC listings in August.

Awards this month feature Belgium, Brazil, Canada, Canary Islands and Cuba.

Worked All Belgian Provinces

Issued by Union Belge des Amateurs-Emetteurs (UBA) to all amateurs and SWLs. Contacts after 1 January 1995. All bands and modes. Europeans must contact all 10 Belgian Provinces, and the City of Brussels on at least two bands, 22 contacts in all.

DX stations need one QSO in each Province, and Brussels, 11 contacts. The Provinces are: Antwerpen (AN), Hainaut (HT), Luxembourg (LU), Brussels (BR), Limbourg (LB), Namur (NM), Brabant Walon (BW), Liege (LG), Oost-Vlaanderen (OV), Vlaams-Brabant (VB), and West-Vlaanderen (WV).

Contacts with VB and BW count only as from 1 January 1995. GCR list and fee of \$US7.00 or 10 IRCs go to: Danny Commyne ON4ON, UBA Awards Manager, Rozenlaan 36, B-8890 Dadizele, Belgium.

Worked All America (Brazil)

Confirm contacts with 45 countries in the American Geographic area. A PY contact is mandatory. CE Chile, VP8/LU Antarctica, PY Brazil, HR Honduras, CE0 San Felix, VP8/LU Stn Orkney, PY0 Trinidad, J7 Dominica, FG Guadeloupe, VP9 Bermuda, TG Guatemala, KG4 Guaniamo Bay, FOXX Clipperton, YN Nicaragua, VE Canada, KP5 Descheche, FY French Guiana, YV0 Aves Island, VP2E Anguilla, KV4

Virgin Islands, HH Haiti, VP2M Montserrat, HI Dominican Republic, 8P Barbados, VP2V Bnt Virgin Isl, PJ Neth Antilles, 9Y Trinidad/Tobago, PJ Sint Maarten, HK0 San Andres, CE0 Easter Isl, VP8 Falklands, PY0 F de Noronha, J3 Grenada, CO Cuba, VP8/LU S Sandwich, PY0 P/Paul Rocks, K,W USA, FM Martinique, XE Mexico, TI Costa Rica, KL7 Alaska, FP St Pierre/Miquelin, YS Salvador, V3 Belize, HC Ecuador, ZF Cayman Isl, V4 St Kitts, etc, LU Argentina, HK Columbia, 8R Guyana, OA Peru, HP Panama, CE0 Juan Fernandez, VP8/LU Stn Georgia, J6 St Lucia, CX Uruguay, VP8/LU S Shetlands, PZ Surinam, KC Navassa Isl, FO8 Fr Polynesia, XF4 Revilla Gigeo, TI9 Cocos, KP4 Puerto Rico, FS St Martin, YV Venezuela, V2 Antigua, HC8 Galapagos, ZP Paraguay, 6Y Jamaica, H8 St Vincent, OX Greenland, VP5 Turks/Casos, HK0 Malpelos, and C6 Bahamas.

All contacts must be made from the same country, or within a radius of 125 miles (208 km). Contacts with ships (anchored or not) and aircraft are not acceptable. No date requirements. Three types of certificates are awarded, Mixed, Phone and CW. GCR is acceptable. The fee for this Award is 10 IRCs or equivalent. Any submissions should be sent to: LABRE Headquarters, Award Manager, PO Box 07-0004, 70 359-970 Brasilia DF, Brazil.


CW Operators of the British Commonwealth (Canada)

Make CW contact with British Commonwealth stations after 1 January 1980. SWL OK. The Basic certificate is earned by completing the requirements for Class 1, then higher levels individually or all at once. Available in three classes.

Class 1 requires 1 QSO with ZL North Island, 1 ZL South Island, 3 VK 1 to 7; 1 V85, V56 or 9M2.6.8; 1 VU2; 3 ZS 1 to 6; 2 VP2, or V2, 3, 4; 3 VE, VO VY2, 3; and 6 G. A total of 22 QSOs.

Class 2 required 1 QSO with ZK or ZL Island; 1 P2 or VK Island; 2 VK6 or VK8; 1 8Q, VU7, 4S7, or 9V; 1 C5, 9J, 9G, or ZD8; 1 VP8 or VP9, 4 VE2, VE3 or VY9, 3 VE4, VE5, VE6, or VE7, 3 each GI and GM; 2 GW; 2 GD, GI, or GU, and 1 ZB2. A total of 28 QSOs.

Class A1 requires QSOs with 15 or more stations in 15 different call areas from the following list: A2, A3, C2, C6, H4, J3, J6, J7, S2, S7, T2, T3, VE8, VP5, VR6, VQ, VY1, YJ8, Z2, ZC, ZD7, ZD9, ZS8, 3B, 3D, 5B,



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5H, 5N, 5W, 5X, 5Z, 6Y, 7P, 7Q, 8P, 8R, 9H, 9L, 9X, and 9Y. A total of 15 QSOs.

GCR list is important. No charge for award, but at least three IRCs are needed for airmail. Apply to: Vince Thorneycroft VE1RJ, 35 Clearview Avenue Fredericton NB, Canada E3A 1J9.

Canary Islands Diploma

Work different EA8 stations since 29 April 1971 on all bands/modes. EU need 40, Spain and Portugal need 60. South America, Central America and Caribbean need 30. USA, Canada and Africa need 20. Asia and Oceania need 10. GCR list and a fee of 15 IRCs should be sent to: Alfonso L. Hernandez EA8ZX, Box 221, 35080 Las Palmas, Gran Canaria, Spain.

Caribbean Award (Cuba)

Class 1 Excellent. Work 30-32 of the 32 countries and call areas in the Caribbean including those countries with a coast on that area such as XE, V3, TG, HR, YN, TI, HP, and YV. Class 2, work 25-29 of the countries. Class 3, work 20-24.

A QSO with CO/CM is mandatory. KG4 is not acceptable. General requirements. All bands and modes. SWLOK. The fee required is 10 IRCs or \$US5.00. GCR accepted. Apply to: Luis Gomez CT1ESO, PO Box 207, 8900 V R St Ant, Portugal.

*4 Brook Crescent, Box Hill South, VIC 3128
Phone (03) 9889 8393

Canadian QSOs including VE0, and two points for others. Canadians with RAC suffixes are worth 20 points. Multiplier is Canadian provinces and territories (max 12), counted once per band and mode. VE1/CY9/CY0 (NS), VE2/VA2 (QC, QU or PQ); VE3/VA3 (ON); VE4 (MB); VE5 (SK); VE6 (AB); VE7 (BC); VE8 (NWT), VE9 (NB); VO1/VO2 (NF); Yukon (YU or YT) VY2 (PEI). Final score equals points x multiplier. Send your log and summary sheet by 31 July to: RAC, 720 Belfast Rd #217, Ottawa ON K1G 0Z5, Canada.

Australasian QW & Phone Sprints

5 July (CW), 12 July (Phone); 1100-1159z Sat.

Presented by David Box VK5OV

The Adelaide Hills Amateur Radio Society is pleased to announce the 12th Australasian Sprints, which are open to all amateurs and SWLs in VK, ZL and P2. The object is to make (and SWLs to hear and log) as many contacts with amateurs in VK, ZL and P2 as possible, without duplication, on 80 m during a one hour period. Groups of amateurs using a single callsign, eg clubs, are also eligible. Frequencies are 3500-3700 kHz (CW) and 3535-3700 kHz (phone). RS(T) is optional, and the minimum exchange is a serial number starting at any number between 001 and 999, reverting to 001 if 999 is reached. (Note: RS(T) may be required for contacts with participants in any other VK or ZL contests during the same period.)

For each QSO, logs must show the date and time (UTC), callsign worked (or both callsigns for SWLs), and serial numbers sent and received. Logs must be accompanied by a summary sheet showing the name and date of the sprint (CW or Phone), the operator's callsign, name and address, the total number of contacts claimed, and a declaration that the operator has observed the rules and spirit of the contest. Any special information should also be mentioned, eg QRP or mobile operation. Multi-operator/club entries must show the callsigns and names of all operators.

Send logs to: AHARS, PO Box 401, Blackwood, SA 5051 to be received by 15 August, with the envelope endorsed CW, Phone, or SWL Sprint. Alternatively, logs can be sent via packet to: VK5AFO@VK5WI.#ADL.#SA AUS.OC or e-mail to cavid@picknowl.com.au

Certificates will be awarded to the highest scoring station in each section in each VK, ZL, and P2 call area. Trophies will be awarded to the outright winners. A certificate will also be awarded to the highest scoring Novice entrant in the CW Sprint, providing that the recipient is not entitled to another

Contests

Peter Nesbit VK3APN - Federal Contest Coordinator*

Contest Calendar June - August 1997

Jun 1	Portugal Day Contest (SSB)	(May 97)
Jun 7/8	IARU Region 1 Field Day (CW)	(May 97)
Jun 14	QRP Day Contest (CW)	(May 97)
Jun 14	Asia-Pacific CW Sprint	(Jan 97)
Jun 14/15	ANARTS RTTY Contest	(May 97)
Jun 14/15	South America WW Contest (CW)	
Jun 21/22	VK Novice Contest	(May 97)
Jun 21/22	All Asia CW DX Contest	(May 97)
Jun 28/29	ARRL Field Day	
Jul 1	Canada Day (CW/Phone)	
Jul 5	Australasian 80 m Sprint (CW)	
Jul 5	Jack Files Memorial Contest (CW)	
Jul 5	NZART Memorial Contest (Phone/CW)	
Jul 12	Australasian 80 m Sprint (Phone)	
Jul 12	Jack Files Memorial Contest (Phone)	
Jul 12/13	IARU HF Championship	
Jul 19	South Pacific 160 m Contest (Phone/CW)	
Jul 19	Colombian DX Contest (Phone/CW)	
Jul 26	Waitakere 80 m Sprint (Phone)	
Jul 26/27	RSGB IOTA Contest	
Aug 2	Waitakere 80 m Sprint (CW)	
Aug 2/3	YO DX Contest	
Aug 9/10	Worked All Europe (CW)	
Aug 16/17	Remembrance Day Contest	
Aug 16/17	Keyman's Club of Japan (CW)	

For information and assistance this month, thanks to VK4EFX, VK5OV, VE2ZP, ZL1BVK, RSGB, and ARRL. Until next month, good contesting!

73, Peter VK3APN

Canada Day Contest (CW & Phone)

0000-2359z, Tuesday, 1 July

This contest, which runs on 1 July each year to celebrate Canada's confederation, takes place this year on a Tuesday.

Bands are 160-2 m, CW and phone. Suggested frequencies are: (CW) 25 kHz up from the band edge, and (SSB) 1850, 3775,

7075, 7225, 14175, 21250, and 28500 kHz. Check for CW activity on the half hour. Note there are to be no CW QSOs in the phone sub-bands, and vice-versa.

Any station can work any other, once per band and mode. Exchange RS(T) and serial number; Canadians will send RS(T) and province/territory. Score 10 points for

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YAESU FT-8000R 2m/70cm Mobile

The stunning new Yaesu FT-8000R is a state of the art 2m/70cm band mobile transceiver that introduces industry-first features in a very easy to operate combination. The first Amateur VHF/UHF mobile rig to provide superwide receiver coverage (110-550MHz and 750-1300MHz*), together with MIL-STD-810 shock and vibration rating for years of reliable operation, it also features:

- Rear panel socket for 1200 and 9600 baud Packet operation
- 3 selectable power output levels
- Inbuilt antenna duplexer for immediate dualband antenna use.
- 110 memory channels for storage of your favourite frequencies
- Dual receive capabilities (VHF/UHF, VHF/VHF, UHF/UHF)
- Huge "Omni-glow" backlit LCD screen showing frequency, memory, and function activity
- "Enhanced Smart Search" for automatic search and loading of active frequencies into 50 special memories.

Specifications:

- Frequency coverage:
- Transmit 144-148MHz, 430-450MHz
 - Receive : 110-550MHz, 750-1300MHz* (800MHz Cellular locked out)
 - Transmit power: - 2m : 50w, 10w, 5w, 70cm : 35w, 10w, 5w
 - Size : 140mm x 40mm x 152mm (WHD without knobs)

- Inbuilt crossband repeater facility
- CTCSS for repeater access where sub-audible tones are required.
- Wide range of tuning steps, with different settings for each band

Supplied Accessories:

- MH-4286J handheld microphone
- MM5-36 mobile mounting bracket
- Fused DC power cord



Cat D-3316

2 YEAR WARRANTY

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YAESU FT-736R VHF/UHF Base Station Transceiver

Whether your interest is in talking through your local repeater, operating SSB DX, or talking to the world via satellite, this high-performance multi-mode base station transceiver can do it all! In its standard form, the FT-736R provides 25W output on the 2m (144-148MHz) & 70cm (430-450MHz) bands in SSB, CW, and FM modes. Can be expanded to cover the 6m (50-54MHz) & 23cm (1240-1300MHz) bands by installing optional modules.

Features:

- Digital control with keypad or VFO frequency entry.
- Efficient switch-mode AC power supply.
- 100 general-purpose memories
- 10 full-duplex crossband memories, 2 independent VFOs per band
- 2 full-duplex VFOs - transmit & receive frequencies (and modes) can be tuned independently or synchronously for satellite operation
- Adjustable IF Notch and IF Shift filters.
- Noise blanker, 3-speed selectable AGC.
- High-stability (± 1 ppm) PLL reference oscillators
- Speech processor and VOX for SSB
- VFO or selectable channel steps on FM.
- Digital input connection for packet TNCs.



2 YEAR WARRANTY

Cat D-2920

\$2495



Specifications:

- Modes: LSB/USB (J3E), CW (A1A), FM (F2D, F3E)
 Receiver: 50, 144MHz: Dual Conversion
 Other Bands, Triple Conversion
 Sensitivity SSB/CW better than 0.2uV for 12dB S+N/N
 FM. better than 0.35uV for 12dB SINAD
 Dimensions: 368 x 129 x 286mm (WHD)

Offers expire 31/5/97

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 1300 366 644 (Local Call Charge) Or Fax: (02) 9805 1986**

Yaesu FT-1000MP

Incredible Performance, Amazing Price!



Now's your chance to pick up Yaesu's latest high performance HF base transceiver, the new FT-1000MP, at a great new price. You'll be amazed at its incredible performance, but if you need convincing, just read what the experts have to say

On Operation:

"I would classify the transceiver as 'user friendly' compared to some other modern transceivers I have operated." - CQ
 "..... we found it to be a proficient performer." - QST
 ".... In terms of ergonomics my preference is marginally for the Yaesu.... The second receiver is certainly better implemented...."
 - Radio Comms (UK)

On Documentation:

"In general Yaesu's manuals are the epitome of clear, concise, and complete documentation, and the FT-1000MP's 104 page Operating Manual is no exception" - QST

On The Receiver:

"Its receiver is a real beauty ... its very clean and the audio is very clear and punchy" - Radio & Communications
 "Measurement of second order intermodulation ... showed an average result for the IC-775DSP but the FT-1000MP was some 10dB better than any other radio measured." - Radio Comms (UK)
 "The receiver is quiet and good at its job, and Yaesu's EDSP is icing on the cake" - QST
 "Certainly this receiver is designed to withstand the onslaught of very strong signals...." - CQ

On The Transmitter:

"CW operators will be impressed with the FT-1000MP keyer." - CQ
 "The transmitter is good as well, with a lightning fast automatic tuner built in as standard." - Radio & Communications
 "The FT-1000MP has excellent spectral purity of the output signal" - CQ

Digital Signal Processing:

"The EDSP filter operates smoothly and effectively in all of its modes." - CQ
 "Having the DSP built-in means it works as well as possible - and is clearly better than most after-market add-ons." - Radio & Communications
 "The double-whammy of crystal and mechanical filters plus DSP in the FT-1000MP is a killer combination" - QST

Conclusions:

"I am unable to report finding even a picky fault with the FT-1000MP" - CQ
 "So does the inbuilt DSP say 'buy me'? In this humble scribes opinion, you bet!" - Radio & Communications
 "The FT-1000MP offers performance and flexibility in a quality radio" - QST

Interested in more information? Why not call us for a copy of Yaesu's 12 page colour booklet, 46 page Technical Overview, or for copies of various magazine reviews. We're sure you'll soon agree that the world of HF transceivers has just taken a giant leap forward

QST - ARRL QST (USA) Magazine review April 1996
 CQ - CQ (USA) Magazine review April 1996
 Radio Comms - Radio Communications (UK) review January 1996
 Radio & Communications - Radio & Communications (Aust) review July 1996

Cat D 3400

\$3995

2 YEAR WARRANTY



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award in this Sprint. Other awards may be made at the Contest Manager's discretion. Standard disqualification criteria apply, and the Contest Manager's rulings and decisions are final.

These contests are recommended as a good Saturday evening's entertainment. If you have never entered a contest before, here is a good, friendly time to start.

Jack Files Memorial Contest

5 July (CW), 12 July (Phone); 0800-1400z Sat.

Presented by Peter Dawson VK4EFX

This contest honours the late Jack Files, a long-serving VK4 WIA Councillor. The object is for amateurs throughout VK/P2/ZL to work as many VK4 Towns and Shires as possible, to encourage portable/mobile activity from the less populated VK4 towns and shires, and to serve as a warm-up for the Remembrance Day contest.

Sections are: (a) Single Operator Home; (b) Club Fixed; (c) Single Operator Mobile/Portable; (d) Club Mobile/Portable; (e) Stations outside VK; (f) SWL. Operate on 160, 80 and 40 m. Cross band contacts are not allowed.

Exchange RS(T) followed by a serial number starting at 001 and incremented by one for each QSO, continuing when changing bands. Multi-transmitter stations should use separate serial numbers starting at 001 for each band. VK4 entrants will send their two letter shire code after their serial number.

Score one point per QSO with non-VK6, and two points per QSO with VK6. Each VK4 Shire/Town Code per band counts as a multiplier, also each prefix per band. To stimulate portable/mobile activity, portable/mobile stations can also claim one multiplier per band for each VK4 Shire/Town from which they operate. The final score equals total points times total multiplier.

In this contest only, single operators are allowed to have a log keeper. Club stations can use multiple transmitters, providing there is only one station on each band at any one time. These transmitters need not be co-located, and may even be in different shires. Note. Stations can be re-contacted on the same band after one hour. Contacts with entrants in other contests are valid, as are DX contacts, and those with VK6 stations are encouraged.

Attach a summary sheet showing the name, address and callsign of the entrant, section entered, points claimed, and a declaration that the rules and spirit of the contest were observed. Send logs to: Jack Files Contest, GPO Box 638, Brisbane QLD 4001 to be received by Monday, 1 September 1997. Trophies will be awarded to the highest

scorer in each section and the highest Novice overall, providing there are at least five entrants in that section. Certificates will also go to the three highest scorers in each section.

VK4 City/Town/Shire codes are as follows:

AL Albert; AC Aramac; AN Arakun (R); AT Atherton; BL Balooine; BA Banana; BC Barcaldine; BO Barcoo; BH Bauhinia; BT Beaudesert; BY Belyando; BD Bendemere; BG Bogginda; BK Blackall; BV Boonah; BQ Boonigga; BZ Bouila; BW Bowen, BN Brisbane; BS Broadsound; BP Bulloo; BU Bundaberg; BI Bungil; BK Burdekin; BR Burke; BE Burnett; CB Caboolture; CS Cairns; CL Calliope; CA Caloundra; CM Cambooya; CD Cardwell; CP Carpentaria; CT Charters Towers; CH Chinchilla; CF Clifton; CY Cloncurry; CK Cook; CN Crows Nest; CR Croyden; DY Dalby; DL Dalrymple; DI Diamantina; DG Douglas; DU Duaringa; EA Eacham; ED Eidsvold; EM Emerald; EK Esk; ET Etheridge; FZ Fitzroy; FL Flinders; GT Gatton; GH Gayndah; GD Gladstone; GC Gold Coast; GI Goondiwindi; HT Herberton; HB Hervey Bay; HK Hinchinbrook; JE Jericho; JO Johnstone; JY Jondaryan; KY Kilcoy; KK Kilkivan; KG Kingaroy; KO Kolan; LA Laidley; LV Livingstone; LC Logan; LO Longreach; MC Mackay; MA Mareeba; MO Maroochy; MB Maryborough; MK McKinlay; ML Milmerran; MN Mirani; MV Miriam Vale; MT Monto; MZ Mornington (R); MI Mt Isa; MM Mt Morgan; MU Mundubberra; MY Murgon; MX Murilla; MH Murweh; NN Nanango; NE Nebo; NO Noosa; PO Paroo; PD Peak Downs; PY Perry; PR Pine Rivers; PT Pittsworth; QL Quilpie; RC Redcliffe; RD Redland; RI Richmond; RH Rockhampton; RM Roma; RO Rosalie; SA Sanna; ST Stanthorpe; TB Tambo, TA Tara; TM Taroom; TH Thuringowa; TI Tiaro; TO Toowoomba; TE Torres, TV Townsville; WG Wagamba; WO Wambo; VR Warroo; WA Warwick; WH Whitsunday; WI Winton; WD Wondah; WC Wocoo.

(R) = restricted area for radio transmission (Shire entry permit required).

NZART 80 m Memorial Contest (Phone/CW)

0800-1400z, Saturday, 5 July

VKs are invited to join ZLs in this yearly contest to commemorate amateurs lost in World War II. It is open to single operator stations on 80 m, fixed and mobile. The contest has six operating periods, each of one hour, from 0800z-1400z.

A station may be contacted TWICE during each operating period (once on phone and once on CW), providing that such contacts are not consecutive. Exchange RS(T) plus

serial number commencing at any number between 001 and 300 for the first contact. On phone, score 15 points for the first QSO with a scoring area, 14 points for the second QSO with that area, descending to one point for the 15th and subsequent QSOs with that area. The same scoring system is used for CW, except that QSO points remain at five for the 11th and subsequent QSO with that scoring area. Scoring areas are VK and ZL prefixes/areas, and DXCC countries. The rules for SWL entrants are similar, except that the callsigns of the stations heard and being worked must be given, and only the cipher of the station heard is required.

Send logs and summary sheets ASAP to: Memorial Contest, PO Box 20 332, Auckland 7, New Zealand. Nominate the category entered (Open; Phone; CW; Beginners CW; QRP; Home-made SSB), and include a points summary showing the number of QSOs and points for each VK/ZL call area worked. Certificates will be awarded to the top three scoring VKs.

IARU HF Championship (Phone/CW)

1200z Sat to 1200z Sun, 12-13 July

This popular contest runs on the second full weekend of July each year. Bands are 160-10 m. Categories are single operator CW only, phone only, mixed; multi-operator single transmitter mixed mode only. Multi-operator stations must remain on a band for at least 10 minutes at a time (exception: IARU member society HQ stations may operate simultaneously on more than one band with one transmitter on each band/mode, providing only one HQ callsign per band is used).

Exchange RS(T) and ITU zone (P2 = 51, VK4/8 = 55, VK6 = 58, and VK1/2/3/5/7 = 59). HQ stations will send RS(T) and official society abbreviation.

Claim one point for QSOs within own zone or with an HQ station, three points for QSOs with a different zone in own continent, five points for QSOs with different continents. Multiplier is total ITU zones plus IARU HQ stations worked on each band. Final score is total QSO points from all bands x sum of multipliers from each band.

Include a dupe sheet for 500+ QSOs. Send logs postmarked by 8 August to: IARU HQ, Box 310905, Newington, CT 06131-0905, USA. Official forms and an ITU zone/prefix/continent map can be obtained from the same address on receipt of a large SASE with two IRCs or equivalent. Certificates to the top scorers in each category, in each state, ITU zone, and DXCC country. Also, stations with 250+ QSOs or 50+ multipliers will receive achievement awards.

2nd South Pacific 160 m Contest

0700-2330Z, Saturday, 19 July
Presented by Ian Godsil VK3DID

This contest is scheduled for the third full weekend of July, and last year attracted large numbers of stations from Australia, New Zealand, and several DX countries. Since then a high level of overseas interest in this contest has developed. So, given the right conditions, there is a chance to make some good DX QSOs on this challenging band, in addition to many VK, ZL and (hopefully) P2.

The objective is for VK, ZL and P2 stations to work as many local and overseas stations as possible on 160 m. DX stations are also encouraged to participate, but can only work VK, ZL, and P2.

Sections are CW, Phone, and SWL (all single operator). Exchange RS(T) plus serial number. Stations should claim two points per QSO with their own call area, or five points per QSO for all other call areas. For VK and ZL entrants, if the number in your callsign differs from your actual location, please follow your callsign with the appropriate numeral to indicate your location.

The multiplier is the number of VK and ZL call areas worked, plus the number of DXCC countries worked, excluding one's own country. The final score equals the total QSO points times the multiplier.

Certificates will be awarded to the top scoring stations in each section, in each call area of VK and ZL, and each DXCC country. Send your log, signed summary sheet, details of your station, and any comments to: Ian Godsil VK3DID, 25 Monaco Street, Parkdale VIC 3194, Australia, to be received within six weeks after the end of the contest. For 1997, this is 29 August. Logs in 3.5" DOS format are most welcome.

Colombian Independence Day Contest

0000-2400Z, Saturday, 19 July

This is a world-wide contest, all bands 80-10 m. Categories are Phone and CW (not mixed): single operator (single and all band), and multi-operator (single and multi-transmitter). Exchange RS(T) plus serial number. Score five points per HK QSO, three points per QSO with stations in another country, one point per QSO with stations in same country, and 10 points for QSOs with official HK HQ Stations. The multiplier is the total countries including HK plus HK call areas worked on each band. "HK" includes all Colombian prefixes. Final score is total QSO points from all bands x sum of multipliers from all bands. At least 2% of QSOs must be with HK, and 10% with stations outside your country. Send logs postmarked by 29 August to: Colombian

Independence Day Contest, Apartado 584, Santafe de Bogota, Colombia.

Waitakere 80 m Sprint

Phone: 1000-1100Z, Saturday, 26 July
CW: 1000-1100Z, Saturday, 2 August

This 80 m sprint contest is open to all VK and ZL amateurs. In fairness to other amateurs, it is requested that no linear amplifiers be used in the contest. Call "CQ Sprint", and exchange serial numbers commencing at 001 and incrementing by one for each contact. RS(T) is not required.

Logs must show the stations worked, and the serial numbers sent and received. Attach a summary sheet and send the log to: Sprint Contest Manager ZL1BVK, 14 Takapu Street, Henderson, Auckland 1208, New Zealand to arrive by 2 September. Alternatively, logs may be sent via packet, using three columns only with no commas or other delimiters. to: ZL1BVK@ZLIAB. Certificates will be awarded to the overall winner, the best score in each ZL call area, and the three best VK scores.

R5QB Islands On The Air Contest (Phone/CW)

1200Z Sat - 1200Z Sun, 26-27 July

This contest is intended to promote contacts between qualifying IOTA island groups and the rest of the world, and to encourage expeditions to IOTA islands. Sections are: IOTA Island Stations (ie those with an IOTA reference); World; and SWL. You can enter as CW only, SSB only, or mixed mode. Single operator stations can enter as unlimited (no time limit), or limited (12 hours max, with off periods at least 60 minutes long and marked in the log).

Use 80-10 m, avoiding 3.56-3.6, 3.65-3.70, 14.06-14.125, and 14.3-14.35 MHz. Exchange RS(T) plus serial number, plus

IOTA reference number if applicable. Stations can be contacted on both phone and CW on each band. Use the same serial numbering system for both modes.

Score 15 points per QSO with an IOTA station (including UK), five points for contacts with stations in another DXCC country, and two points per QSO with one's own country or IOTA reference. The multiplier equals the total IOTA references per mode per band, added together. The final score equals the total QSO points x the total multiplier.

For each band (but not each mode), submit a separate log, multiplier list, and dupe sheet. Send your log and summary sheet to: R5QB IOTA Contest, PO Box 9, Potters Bar, Herts EN6 3RH, postmarked no later than 31 August. A comprehensive range of awards is offered to the leading stations in each category, section and continent.

Results of 1995 ARRL 160 m DX Contest

(Score/QSOs/Mult)

VK3DXI 32 4 4

Results of 1995 ARRL 10m Contest

(Score/QSOs/Mult/Mode/Pwr)

VK2APK	17,982	214	27	Mixed	L
VK4EMM	19,000	244	25	Mixed	H
VK4NEF	2,142	119	9	Phone	QRP
VK4XA	12,744	177	18	CW	L
VK4TT	2,016	72	7	CW	L
VK4XXV	784	49	4	CW	L

Results of 1995 ARRL RTTY Roundup

(Score/QSOs/Mult/Hours)

VK6GOM 6,360 159 40 15

*PO Box 2175, Caulfield Junction, VIC 3175
puesht@melbpc.org.au

ar

WIA MORSE PRACTICE TRANSMISSIONS

VK2BWI	Nightly at 2000 local on 3550 kHz
VK2RCW	Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm
VK3COD	Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz
VK3RCW	Continuous on 145.650 MHz, 5 wpm, 10 wpm
VK4WIT	Monday at 0930 UTC on 3535 kHz
VK4WCH	Wednesday at 1000 UTC on 3535 kHz
VK4AV	Thursday at 0930 UTC on 3535 kHz
VK4WIS	Sunday at 0930 UTC on 3535 kHz
VK5AWI	Nightly at 2030 local on 3550 kHz
VK5VF	Continuous on 145.650 MHz, 5 wpm to 12 wpm
VK6RCW	Continuous on 147.375 MHz, 3 wpm to 12 wpm



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Club Corner

VI75RAAF

Well, VI75RAAF is well and truly over. Roy, our President, closed the Special Event when he worked ZL1AK at 2359z on 31 December, 1996. A sterling effort by you all. Well done.

We finished up with 5,976 QSOs and I have sent out 620 Awards and 1182 QSL cards. There will be a few more before my job is finished and I hope that I will have sufficient awards and cards for everyone. Band conditions have not been perfect, as you all know, so what we have achieved is outstanding and I am sure the RAAF have had value for their Award and QSL outlay.

Both the Award and QSL card have been well received world wide and I have had no adverse comments. As far as I know, only one award went astray and this was replaced promptly.

We worked into 95 countries spreading the word of our 75th Anniversary, and in doing so we made many new friends.

Thank you again for all of your efforts.

Brian Lavender VK4LV
Awards Manager AFARN

North West ATV Group

The North West (Tasmania) Amateur Television Group was recently asked to participate in the Australian National Rowing Championships being conducted at Lake Barrington on the six days of 1 to 6 April 1997.

The request from The Tasmanian Rowing Organising Committee was to provide video coverage of the rowing events, in particular from the start line through to the 1000 metre mark.

Several members of the group and other interested persons provided the facilities to allow the coverage to occur and were Ken VK7KKV, XYL Bet and granddaughter Karah; Max VK7KY and XYL Shirley; Bob VK7ZGR; Jim VK7JH; Barry VK7FR; John VK7KCC; Steve VK7UD; Ross VK7WP; Allan VK7KAN; and Tony VK7AX (a total of 13 personnel).

Cameras at various points earned the vision by cabling or off air links to a central building. The start line signal was transported to the switching point via a 1250 MHz FM transmitter, the 750 m line via a 70 cm transmitter, and another 70 cm transmitter at the 1000 m line. The general "panoramic view" position, along with another camera at the finish line, was cabled to the switching centre.

From the switching centre the video and

sound commentary was fed to various television monitors via closed circuit cabling located in the commentary room (in the finish tower), the secretary/organising area, the facilities building (2), the canteen, the refreshment tent and the boat shed. Spectators and competitors were able to view the races from these monitors and were kept up to date with activities and events from the start line which cannot be seen from the general spectator areas.

"Mr Murphy" was present nearly every day. However, the technical problems were soon overcome as expected with true amateur spirit. One of the highlights, which was a hit with the organising committee and spectators alike, was the appearance of an echidna on the television monitors for a short period, the commentator suggesting that many people, including animals, were always striving to get a look at the rowing!

The organising committee have been full of praise to the ATV Group for the job they did and were very appreciative of our efforts, suggesting we conducted ourselves and produced results in a professional manner. To quote the committee, "Once again Tasmania has shown the mainland how it can be done".

I personally take the opportunity of thanking all personnel involved in the exercise for their enthusiasm and dedication. Whilst it was a lot of work, I trust they enjoyed themselves. Once again it shows what a group of enthusiasts can do and achieve when committed with a desire to work as a team.

Amateur radio has once again gained benefit from this latest publicity.

Tony VK7AX
Group Leader
North West (Tas) ATV Group

Radio Amateurs Old Timers Club (RAOTC)

The office-bearers for 1997/8, elected at a committee meeting on Tuesday, 13 May, are: President and Broadcast Presenter, Allan Doble VK3AMD; Vice President, John Fullagar VK3VY; Secretary/Treasurer, Arthur Evans VK3VQ; Broadcast Co-ordinator, Ron Fisher VK3OM; Magazine Producer, Stewart Day VK3ESD; Historian, Bill Gronow VK3WQ; Membership Promotion, Milton Crompton VK3MN; and Ken Seddon VK3ACS.

Allan Doble VK3AMD
President
ar

Divisional Notes

Forward Bias - VK1 Notes

Hugh Blemings VK1YYZ

The new committee has all but settled into "office" and is looking forward to building on the work of its predecessor in the months ahead. As president, I would encourage you to contact me on any matter you feel should be brought to my attention. I can be contacted by phone on 0411 516 079 (business hours) and 06 254 7855 (home), or by email at hugh@eclectech.com.au.

The committee feels the Division is faced with both a number of challenges and some exciting opportunities. We would welcome, by need, your input to ensure that the directions taken meet the needs, wants and preferences of the membership.

This *Forward Bias* is the first to appear after Peter Parker VK1KP stepped aside two months ago to pursue his many other interests in the hobby. His contribution was greatly appreciated by the Division and, I believe, by the many listeners to the VK1 Divisional broadcast. A hard act to follow. However, our new broadcast officers, Waldis VK1WJ and Bernie VK1KIP, have risen to the challenge and have been doing an excellent job of keeping us up-to-date. Peter is continuing to provide regular articles of interest to all for *Amateur Radio* and we wish him well.

Thanks to the efforts of Warren VK1XWT and Carl VK1KCM, the VK1 Division's Web site is ready to go on-line. We're expecting final configuration to be completed by the time you read this edition of *Amateur Radio*. Once operational, this site will have a calendar of coming events as well as contact details for the division etc. Have a look at <http://www.vk1.wia.ampr.org> and see what's there. Our thanks also to ADFA for allowing Warren's server to be used in this role.

In addition to the Web site, Internet based e-mail will be run from this site, allowing you to, for example, e-mail president@vk1.wia.ampr.org. Mail sent to these addresses will then forward to the committee members' personal account external to ADFA. This service is still being commissioned so, for now, use the existing contact arrangements.

Recent events for the Division have included a number of well attended foxhunts, an informative site tour around the facilities of the Australian Centre for Remote Sensing (ACRES), and three different communications exercises involving walkers, non polluting water craft and rally cars. By the time you read this column, this list will

have been rounded out with an informal dinner.

Coming Events

A foxhunt will be held on 15 June at 2 pm. Liaison for this event is on the Division's Black Hill repeater, 146.900 MHz. The fox will be operating on 146.5 MHz. The meet point is yet to be determined; listen to the broadcast or check the web site for further details.

23 June will see our usual general meeting held in the Griffin Centre at 8 pm. Note that we now meet in the downstairs meeting room, meaning easier access for all. This is particularly important on this occasion as we will be having an end-of-financial-year junk sale. So, clear out the shack and bring your best goodies along!

Our July meeting is scheduled to be a technical presentation on the Division's new 4800 baud bit regenerative packet repeater. Further details will be available on the web site.

VK5/8 Notes

Ian Hunt VK5QX

The first formal meeting of the new South Australian/Northern Territory Divisional Council took place On Tuesday, 13 May 1997.

At this meeting the officers of the Council for 1997/8 were appointed: President, Ian Hunt VK5QX, 08 8250 1708; Secretary, Graham Wiseman VK5EU, 08 8443 7273; and Treasurer, Joe Burford VK5UI, 08 8280 7555. The other members of Council are Don Christiansen VK5ADC, Jim McLachlan VK5NB, David Minchin VK5KK, Tony Van Lysdonk VK5WC, Phil Pavey VK5VB and Ian Watson VK5KJA.

The Council is comprised of those who nominated for the recent election, those who were continuing in office as part of the usual two year term, and members seconded to Council as a result of the lack of nominations prior to the recent Annual General Meeting.

Phil Pavey VK5VB is an "ex-officio" member of the Council by virtue of his position as WICEN Director. Ian Watson is currently representing our interests at Federal Council as an already accredited Alternate Federal Councillor, pending a final decision regarding permanent appointment to the Federal Councillor position.

The meeting was chaired by our interim chairman, Ben Broadbent VK5ABE, who had continued on Council as part of his elected second year term. At the meeting Ben

tendered his resignation as a member of Council. He explained that this was brought about due to pressure of family and work commitments which naturally had to take precedence over his amateur radio activities. He did say, however, that when the situation changed he would certainly like to again take a seat on the Divisional Council.

The Council reluctantly accepted Ben's resignation and thanked him for the contribution he had made during what had been his second term of service as a member of the Divisional Council. We wish Ben and his family all the very best in the pursuit of their activities.

Some of the additional portfolios to be held by members of Council have been allocated. A full list showing the various responsibilities and contact telephone numbers will be provided in the near future.

The new Council for the 1997/8 period looks forward to working closely with members of the South Australian/Northern Territory Division in such a way as to produce maximum benefit for all members and provide the representation that members desire.

"QRM" News from the Tasmanian Division

Robin L Harwood VK7RH

There was a meeting of Divisional Council on 19 April in Launceston, following the AGM of this Division in late March. All councillors were in attendance, plus five observers present representing the branches. Ron Churcher VK7RN, the Divisional President, chaired the meeting.

The first part of the meeting was an exchange between Divisional and Branch officials on where this Division is going. Several ideas were discussed to breathe new life into the Division.

Following on from a recommendation from the AGM, it has been decided that the 1998 AGM of this Division will be held in the north of the state. Accordingly, a northern sub-committee will be created to organise this in conjunction with other activities, such as a hamfest or dinner. It was pointed out that the involvement of families was crucial to the success of this and other Divisional activities.

Publicity Officers have been appointed to conduct publicity campaigns to increase membership and promote activities within the Division. VK7ZDJ will be responsible for the north-west, with VK7RH and VK7TIM being responsible for the north, and VK7JK and VK7GL looking after the south.

The Division is shortly to have a Web site on Tasmania Online, an initiative of the State Library. Further details will be given over VK7WI as they become available. Also, the

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Northern Branch will have a Web page and I am reliably informed that this could be online by now. Again, check VK7WI for details.

Divisional Council also made the following appointments to the ex-officio positions, following recommendations from the branches. It was further resolved that, in future, these appointments will be made at the AGM.

Tony Bedelph VK7AX was re-appointed as FTAC Officer; Reg Emmett VK7KK was re-appointed Divisional Education Officer; and Trevor Spargo VK7TS is now the QSL Bureau manager after VK7PP stepped down. Thanks Charles for your work in sorting out the many hundreds of incoming and outgoing cards.

Richard Rogers VK7RO continues as Divisional Historian; VK7RH is Intruder Watch Co-ordinator; a new Awards Manager was appointed, John VK7RT; John Rogers VK7JK still co-ordinates the weekly VK7WI broadcast; and VK7RH will continue compiling this column.

After some discussion, it was agreed that the Divisional WICEN co-ordination will be handled by a committee consisting of the President, together with the Southern and Northern Branch co-ordinators (the North-west Branch having nobody in place at this stage). Phil Corby VK7ZAX will be our Honorary Solicitor; and the Honorary Auditor will continue to be Mr Justin Cook. A new position of Publicity Co-ordinator was created and this was filled by Tim Holloway VK7TIM.

There was also an election required for the position of the Federal Councillor as there were three nominations. Andrew Dixon VK7GL was elected and John Rogers was elected as alternate Federal Councillor. We wish to thank Jim Forsyth VK7FJ for his contribution as Federal Councillor for the past three years.

Don't forget, if you have any news for this column, send it to me at 5 Helen Street, Newstead TAS 7250, or to robroy@tassie.net.au **BT**

Education Notes

Brenda M Edmonds VK3KT Federal Education Coordinator*

My last column raised the problem of decreasing recruitment to the Amateur Service, and asked for comments from readers. I was pleased to receive some responses, but mostly they were directed towards agreeing with my comments, and deploring the lack of enthusiasm of teachers when demonstrations of amateur radio are offered.

In the UK it was recognised early that the success of any project to bring amateur radio into the classroom would depend on the enthusiasm of the teachers. With this in mind, there have been several successful weekend seminars to train the teachers. Some of these teachers have gone on to become licensed and to develop exciting school activities. Those who did not attempt to gain a licence still became more receptive to the idea of using amateur radio in the classroom.

I have been looking through the Proceedings of the two ICARE Conferences which have been held so far. They describe a number of projects being run in schools throughout Europe, North America and Africa. Some are designed as an introduction to electronics, eg construction of a rain detector. Others use short-wave listening to extend the curriculum. Others again use more sophisticated techniques to talk to satellites or access weather satellite information, to establish packet networks and to monitor balloon launches. I was very interested in the "Mars Base Simulation" in which a year of

science experiments was conducted over 36 hours in a mock-up of a module suitable for Mars. Information and experiment reports were passed by packet, 2 metre voice radio or closed circuit TV to the "Lunar Base" in the classroom.

There are now over twenty countries associated with ICARE, reflecting a diverse approach to a common aim. In most of the reports, the activities are being conducted at senior school level. I know that New Zealand has programs in some primary schools, but am not aware of any VK activity at that level. I would be most interested to hear of any such activity, or ideas which members consider could be used at primary level. It may be that we need to target the primary level rather than the secondary, to show that there can be fun in radios as well as in computers. We may need to develop simple kits or structured learning packages.

I begin to think that we will need a lot of assistants scattered throughout the country. One person per state at least would be useful, as the educational systems vary so much. I would be happy to receive names of volunteers who could either visit local schools to publicise amateur radio, assist with development of suitable projects, or be trouble shooters by mail or radio. I look forward to receiving a deluge of letters.

*PO Box 445, Blackburn VIC 3130

ar

How's DX

Stephen Pall VK2PS*

It was reported in the last issue of *Amateur Radio* (May 1997) that the WIA submission on amateur radio licensing was presented to the Minister of Communications and, as a result, the Department of Communication will consider the submission when it reviews the Radio Communication Act later this year.

Do I hear somebody saying "about time"? Hopefully, when the review takes place, it will also discuss and re-organise the present inadequate system of issuing full Australian call signs, reserved for the locals, valid for a year, to foreign amateurs who are visiting our country on a short term basis.

The European Community, known as the European Union, already has the CEPT licensing agreement which enables any amateur from any EU country to temporarily operate an amateur radio station in any other EU country and its territories by using the host's overseas country's prefix before the home call. There are plans on the move that a similar system is in place between the North and South American continents soon.

New Zealand has a simple and practical system which is not a licence but a written permit. It is issued for a determined period of number of months on a temporary basis to a visiting foreign amateur who uses his/her home call with the added ZL suffix.

Let me now illustrate to you, with a factual case, how, in the past, a visiting Russian amateur has misused our "easy" system to his advantage. The year is 1996. The amateur is Vlad I Pichelin, his home call is UA0ZDA, and his International Call Book (1996) address is given as: a ya 283.683000 Petropavlosk, Kamchatskij, Russia. Vlad applied for a short term licence to operate from Christmas Island, and he was given a reciprocal short-term visitor's licence with the call sign VK9XL.

When he applied for his licence he gave his home address as PO Box 21, Stavropol, 355002, Russia, a city which is not in eastern Siberia but in the southern part of Russia between the Black Sea and the Caspian Sea, many thousands of kilometres away. To my knowledge Vlad never operated from Christmas Island. QSL cards received by the VK9/0 Federal QSL Bureau indicate that he operated CW only from the following localities: 6 February 1996, Lord Howe Island; 16/17 February, VK6; 28/29 February, VK5; and on 29 February (leap year?) he used the suffix 4K5 which is Azerbaijan. On 5-10 March he was again on

Lord Howe Island, and on 10 April he was there again. Apparently he was not active in May or June 96. The question is, where was he?

On 4 July I had a contact with Vlad at 1218 UTC. He was on 40 metres CW using the call VK9XL/mm. He told me that he was near Kamchatka, and he was going to the IOTA Island AS-39, giving a Victorian amateur's two letter call sign as his QSL manager. I heard him again on 14 July 1996 on 20 metres CW at 1300 UTC giving his call sign as R0/VK9XL. Apparently he landed on that island.

QSL cards in the Federal QSL Bureau for the period 13 July to 20 September 1996 are proof that he used his temporary Australian call sign (which supposedly was issued for a short term to operate in Australia and Territories and for a portable activity for four months only) illegally many thousands of kilometres away. Why? Who knows? Was he in Australia at all? Hopefully, our immigration authorities have a record of his multiple entry-re-entry and departure dates.

Yes, I agree. It is about time that we re-organised the issue of licences to visiting foreign amateurs. A plea to the Spectrum Management Agency: please note the case of Vlad VK9XL.

Macquarie Island VK0TS

Tom VK0TS has been on Macquarie island since late 1996. Heavy work schedules have prevented him from being active on the bands. His predecessor, amateur colleague Warren VK0WH, did his best to reduce the "world demand" for a Macquarie island contact. The demand is still there, and there are many, many more who need Macquarie Island as a "first one".

At the end of April I received a lengthy letter from Tom, written at the time when the last "summer" residents returned to the mainland. Here are some interesting bits. "I have been on air infrequently. The winter down here has commenced and things are less hectic, so I plan to be on air lots more. You will find me on 80 m and 40 m and maybe even 20 m. These are the only bands that I will be working. I have not set up to do CW but will do so very soon. The antenna I am using is an inverted Vee antenna supported very high and proving to be very effective towards Australia."

Tom then describes his actual workload on the island which is very diverse, from maintaining and repairing antenna systems, complex electronic equipment, and VHF

repeaters to repairing video equipment and photocopiers.

Tom continued, "My personal radio equipment is an ICOM IC-751 transceiver. The HF antenna system consists of many inverted Vee systems supported by 72 foot towers. I am not sure what (equipment) the other hams (VK0WG and VK0KBB) are using as they are not very active. As for myself, I will be talking to VK and ZL stations mainly, but I promised Jim VK9NS that I will try to keep in touch with him on 20 metres when time and circumstances permit me to do so."

Tom then gave a short profile of the island which is very interesting. "The island is remarkable. There are millions of penguins here, thousands of seals, and many birds, including different types of albatross. It is geographically located in a harsh climate, with westerly winds prevailing and usually continuous. Usually it is cloudy with rain, sleet or snow and bitterly cold with the wind blowing. The island is about 40 km in length and five km wide with a raised plateau on the centre part and coastal cliffs following the entire coastline to the plateau."

The next ship will visit the island in September. The last one, full of "summer season" scientists, returned to Hobart at the end of April. The DXing world, which eagerly waits on a VK0TS appearance on the bands, must accept the following facts:

a. Tom is there as an employee of the ANARE to do a job. Naturally, amateur radio is just a hobby, and when he has time to indulge in it.

b. Tom is not on a DXpedition, and by nature he is not a keen DXer. He uses amateur radio as a means of communication with his family with the assistance of his VK1 friends, and for occasional QSOs with others.

c. He is unable to keep to predetermined schedules and he is unable to give a multi-band contact or a different mode on demand. Please do not even try. Be happy with the contact which you have.

d. I have not heard any of the two other amateurs on the bands. Most likely they are not DX orientated at all and, as Tom said, they are not very active.

I am sorry that I am not able to bring readers any better news of the state of DX from Macquarie Island.

Heard Island Station VK0IR

In my interview with David Muller VK2IDM, our Australian participant on the Heard Island DXpedition (see May 1997 issue of *Amateur Radio*), I promised to give you more details about the VK and ZL participation. Here are some interesting figures.

The total number of Australian QSOs was

516, and of New Zealanders was 166, which gives a total of 682. The previous VK/ZL total was shown as 713, a difference of 31 QSOs. What happened? The answer is simple. Several DXpeditioners had individual VK0 call signs and made local QSOs on the island with VK0IR. When statistics were analysed in detail, these QSOs were removed from the official tally.

Amateurs in VK1 made a total of 15 contacts on four bands, six on CW and nine on SSB, 12 of them on 20 metres. Amateurs in VK2 fared better with a total of 74 contacts, 19 on CW, 54 SSB and one RTTY. Most of the contacts were on 20 metres and only seven contacts were on 80 metres.

VK3 figures were even better. Out of a total of 111 QSOs, 44 were on CW, 64 on SSB, two on RTTY and one SSB satellite contact. There were two 160 metre contacts and ten 80 m QSOs. VK4 did relatively well despite its northern geographical position. Out of a total of 80 contacts there were two satellite SSB, and 53 other SSB contacts, 24 CW and one RTTY, but only two QSOs on 80 metres. VK5 was at least 1000 km nearer to Heard Island but managed to make only 42 contacts. Nine on CW, 32 on SSB and one on RTTY. VK6, the closest to the expedition, was the best performer with a total of 138 contacts, being 40 CW QSOs (one on satellite), 95 SSB contacts and three RTTY contacts. There were 13 contacts on 80 metres and three contacts on 160 metres. VK7 was a slightly better performer than Canberra with a total of 24 QSOs, 13 on CW, 11 on SSB and two contacts on 80 metres. VK8 had a total of 24 contacts, 13 on CW and 11 on SSB. Norfolk Island VK9N had a total of eight contacts on three bands, being four SSB and four CW QSOs.

The most useable band was 20 metres with 318 contacts. There were 41 QSOs on 80 metres, 32 contacts on 15 metres, 33 contacts on 40 metres and six QSOs in total on 160 metres. There were four satellite contacts and four contacts on 10 metres.

The New Zealanders made 166 contacts, 59 CW, 102 SSB and five on RTTY. Twenty metres was the most useable band for the New Zealanders with 138 contacts; there were only eight QSOs on 80 m.

The maximum number of QSOs with Heard Island were 19 band-mode variations. CW on nine bands including satellite, SSB on seven bands plus satellite, 160 m on CW and RTTY on 20 metres.

There was only one amateur in the world who worked Heard Island on all bands and all modes, JA5EXW. Australia's most successful Heard Island chaser was Mike VK6HD with 15 band-modes.

The souvenir sale to balance the budget of

the DXpedition is now on. A 192 page, hard cover book with many colour photos is available for \$AUS40.00, coloured coffee mugs are \$AUS30.00 each, and the black and white ones for \$AUS20.00. Tee-shirts are \$AUS30.00 each, and a 55 minute video (PAL system) with original sound and music will set you back \$AUS50.00. Add \$AUS8.00 to each order for postage. Send a cheque with your order and size (shirt) requirements to: Heard Island Expedition, Locked Bag 29, Post Office, Rydalmere NSW 2116.

Pacific Wanderings

Jack VK2GJH, better known as T30JH, intends to visit several islands in the Pacific, beginning 27 June and ending around 5 August. Jack is not on a DXpedition and radio is a low key priority during the entire trip. He is on a vessel with a scientific group, in a working capacity both for the vessel charterers and for himself. There will be no maritime mobile operation using island call signs; any maritime contacts will be made using the callsign VK2GJH/mm.

As time and work commitments permit, Jack intends to be active on Rabi Island 3D2JH, 28 June; Suva 3D2JH, 1 July; Funafuti T20JH, 5 July; Tarawa T30JH, 11 July; Banaba T33JH, 15 July; Tarawa T30JH, 27 July; Rotuma 3D2JH/p, 1 August; and Suva 3D2JH, 5 August. The equipment to be used is an Icom 736, 100 W, HF/Six metre transceiver, a trap dipole for HF and a vertical for six metres.

A week ago Jack phoned me and told me that the Kiribati owner of the proposed charter vessel has withdrawn the boat due to a more lucrative offer from somebody else. The organisers of the charter are now searching desperately for a new vessel.

Jack says, "If we are lucky the trip will take place. If no suitable seaworthy vessel can be found (and there are plenty of old "rust buckets" floating in that area) then luck is not on our side and the trip will be abandoned."

However, it seems luck has returned to the group. I was about to finish off this column when Jack phoned again. His voice sounded happy. The organisers of the charter found another reliable boat, therefore the trip is on. Hopefully, all of you can work Jack from Banaba T33. Please note, all QSL cards are to go direct to PO Box 299, Ryde NSW 2112, Australia. No bureau cards please as Jack is not a member of the WIA QSL Bureau. Cards



The 20m vertical array, accommodation and operating tents of the VK5ISL DXpedition to St Peter Island.

sent without a SAE and without return postage will not be answered.

Future DX Activity

* Frank YJ8AA goes to Emai Island, which is in the Shepherd Group of islands (OC-111) with Albert YJ8NKB on or about 1 June. This will be a real adventure as there are no roads, water or other facilities at all. They will take a TS-120 with them.

* Later in the year, Frank intends to visit the Torres Island group (OC-110), which was devastated not so long ago by tidal waves.

* Philippe FSIVE (formerly TR8LVP) is now active from Guinea as 3XY3A, mainly on 14020 and 14130 kHz. He will be there until 15 June. QSL to his home-call.

* The well known DXer Matt SM7PKK is in Uganda on a six months UN contract and will try to be active from that country. He will be also visiting 9Q (Zaire), 9X (Rwanda), 9U (Burundi), and 5H (Tanzania).

* Sayed ST2SA is active, usually during the weekend (20-24 UTC) on 20 metres. QSL via the Call Book address.

* A group of Hungarians will be active from Rhodes Island (SV5) from 3-17 June on all HF bands from 160 to 10 metres on CW, SSB and RTTY. Operators are: Laci SV5/HA0HW/p, Tomi SV5/HA4GDO/p, Laci SV5/HA6NL/p, Zsolt SV5/HA6PS/p and Tibi SV5/HA6ZV/p. QSL to home calls.

* Sanyi HA7VK (ex-XU7VK) will be active as YI9VK from 12 May until 12 July on all HF bands. QSL to HA0HW.

* Nick R1FJV is in Franz Josef Land until the end of the year. He is mainly on CW, 40-10 m. QSL via UA3AGS.

* CY9AA will operate from St Paul Island (NA-094) from 26 June to 3 July.

* Steve HA0DU reports that Zoli HA5PP will be stationed in Aden, Yemen, starting May 1997 for probably a year or so. He is going to get permission to operate from Aden but he wants his licence approved and confirmed by the authorities in San'a. He

plans to come on air in June and intends to make "side trips" to neighbouring countries E3, T5, ST, ST0, and J2).

* **\$79MAD Seychelles.** Paddy will be active for the next four months, especially on the WARC bands. QSL via GW4WVO.

* **Ruth TF/T9ESZ and Ruth TF/LA6ZH** will be active from Reykjavik, Iceland from 13 to 20 June on CW: 7020-7030, 14020-14030, and 21020-2130 kHz; and SSB, 70600-7070, 14240-14250, and 21280-21290 kHz. QSLs to respective home addresses.

Interesting QSOs and QSL Information

* **JW5NM** - Mathias - 14195 - SSB - 1229 - (Apr). QSL via LA5NM Mathias Bjerrang, PO Box 498, 9170 Longyearbyen, Svalbard, Norway.

* **J77FT** - Frank - 14164 - SSB - 0537 - (Apr). QSL via DL7FT Frank Turek, PO Box 1421, 14004 Berlin, Germany.

* **A71CW** - Chris - 21025 - CW - (Apr). QSL via Chris Dabrowski, Box 22101, Doha, Qatar, Middle East.

* **JT1BH** - Sur - 14005 - CW - 0936 - (Apr). QSL via PO Box 125, Ulan Bator 13, Mongolia, Asia.

* **JW0L** - Dave - 14195 - SSB - 1214 (Apr). QSL via G8APB C D Plummer, 27A Thoms Lane, Four Marks, Alton, Hants, UK.

* **8P6DU** - Peter - 7188 - SSB - 0648 (Apr). QSL via Peter Austin, Mayers Road, My Lord's Hill, St Michael, Barbados.

* **TF3DX** - Villie - 14012 - CW - 1311 (Apr). QSL via Vilhjalmur Thor Kjartansson, Silungakvisi 10, IS-109, Reykjavik, Iceland.

* **YI1US** - Duraud - 14246 - SSB - 1144 (Apr). QSL via WA3HUP Mary A Cider, 2485 Lewisberry Road, York Haven, PA 17370, USA.

* **A41LZ** - Murtadha - 21210 - SSB - 0600 (Apr). QSL via PO Box 2837, Ruwi, CP112 - Oman, Middle East.

* **T88CK** - Albert - 14004 - CW - 1233 (Apr). QSL via HB9BCK Albert Zaehner, Scherzinger Str 539, CH-8595, Altnau, Switzerland.

* **9X/RW3AH** - Andy - 14164 - SSB - 0552 (Apr) QSL via Andy B Fyodorov, Box 899, 127018 Moscow, Russia.

* **T70A** - 7048 - SSB - 2032 - (Apr). QSL via ARRSM Radio Club, PO Box 77 RSM-47031, San Marino A 1, Republic of San Marino.

From Here and There and Everywhere

* The most important lesson one has to learn as a regular columnist is that "Murphy never sleeps". It was "Murphy" again at work in my column in the last issue (May 1997) of *Amateur Radio*. The QSL manager for FOOSSJ was given as K8JRK. The name and

address which followed were totally incorrect. The correct address is K8JRK James A Sansoterra, 801 S Oxford, Grosse Pointe, Woods, MI-48236, USA. Thanks to Ken VKSQW for pointing out the error. I should have been warned. "Murphy" has lurked around in past editions of my column. The callign of our Heard Island DXpeditioner, David Muller, originally VK2TQM and now VK2JDM, appeared several times as VK2JDM. Apologies to both call holders for the mix-up.

* **Ed K8VIR/ZL4, K8VIR/ZL9, ZL9DX** was active for a few days from Lord Howe Island as VK9EEH. He also plans to visit Niue on his return to the States. His address in NZ is in order (*Amateur Radio*, May 97). For those who want to send their cards to the USA, his new USA address is Ed Hart, K8VIR, PO Box 480, Green Valley, AZ-85622-0480, USA.

* **Ray VS6UW** is a keen CW operator. He is also a Morse instructor and he would like to set up a museum type collection of vintage Morse keys for the historic education of his Morse students. He is looking for donations of old Morse keys and is willing to pay for the postage. Contact Raymond Lee, PO Box 62316, Kwun Tong Post Office, Hong Kong. E-mail: rlylee@kccrc.com.

* **Percy VK4CPA**, the originator and chief controller of the "ANZA" net, received a Certificate of Distinction for services to amateur radio from the VK4 Division of the WIA in mid April. Congratulations Percy!

* The operator of RO/UR8LV is Oleg and he is located at the northern-most part of Asia at Cape Chelyuskin, an arctic base, at latitude 77° 45' and 104° 20' E. It is a base and connecting point to the Severnaya Zemlya island group and to the arctic coast of Siberia. The base was built in 1934 and has a population of only 22 persons. Oleg is 26 years old, single and started his job in 1994 as a radio engineer with Aeroflot. He is now the "Chief" of the base. When I spoke to him, the weather was windy and the temperature was -17° C. He was using 1 kW into a very long, long-wire antenna. The time difference between Sydney and his base was only two hours. Living is not cheap in the Arctic. A return flight from Chelyuskin to Dickson (73° 30' N and 80° 35' E), a similar base on the northern part of Siberia, costs \$US1600 return. Oleg goes home in May for a well earned rest and returns to his base in the Arctic in September. QSL to his home call via the Ukrainian Amateur Radio League QSL Bureau, Box 56, Kiev, 252001, Ukraine.

* **Dave JW0L** is a radio-telescope scientist on Svalbard Island and will be back in England by June if his contract is not extended. His home call is G3WFT, but his

QSL manager is G8APB. Dave carries a telescopic rifle with him when he is inspecting radio-telescope antennas as protection against polar bear attacks. His equipment is an old valve transmitter and he uses a dipole antenna with a 150 m coax lead-in. His IOTA island is EU-26, the locality is Nyalesand at 79° 00' N and 12° 00' E.

* **Andy 9X/RW3AH** has left Kigali Rwanda and has returned to his home base in Moscow.

* The recent Scarborough Reef BS7H DXpedition was a success. It was decided that the Japanese amateurs will QSL via JA1BK, but all others, including VK/ZLS, should send their cards via John Parrott W4FRU, PO Box 5127, Suffolk, VA-23435, USA.

* According to some French DX Bulletins, the French authorities will introduce a new French novice licence with a "Regulations only" examination.

* The station working as OH0/OZ1WF is a pirate.

* The Scandinavian DX Net is now on the air again every Wednesday from 1330 to 1600 UTC on 14180 kHz. Net controller is Maurice LA3XIA.

* The new QSL manager for AH8A is Ron AC7DX, PO Box 25426, Eugene, Oregon 97402, USA.

* **Bernhard DL2GAC**, "The South Pacific Wanderer", advises that his address is correct only in the 1997 Call Book as Bernard Stefan, Moggenweilerstr 1, D-88677, Markdorf, Germany. However, he prefers QSLs via the Bureau.

QSLs Received

* **9USCW (EA1FFC)** - 4K70GT (3 m - PO Box 169, Baku Centre, 37000 Azerbaijan); **EZ8AQ** (Box 1, Ashabat, 744003 Turkmenistan); **OX3SA** (3 m - Sven Lutzen, Box 1602, DK-3900 - Nuuk Greenland); **FR5ZT/T** (6 w - from VE2NW Zareth Amadiun, 18 Nisko, DOM, Quebec, H9G-2R5, Canada); **SV2ASP/A** (6 w Monk Apollo, Dochiaron Monastery, GR-63087, Mt Athos, Greece).

Thank You

Many thanks to my supporters who regularly supply me with news and information which makes this column possible. Special thanks to VK2XH, VK2JDM, VK2GJH, VK2KFU, VK2JTF, VK4CPA, VK6NE, VK0TS, K8VIR, VS6UW, JW0L, YJ8AA, RO/UR8LV and the DX publications *QRZ DX*, *The DX News Sheet*, *The 425 DX News* and the *GOLIST QSL Managers List*.

*PO Box 93, Dural NSW 2198

Novice Notes

Peter Parker VK1PK*

Assembling a Station

Introduction

The main interest of many amateurs is on-air operating. Indeed, that's the reason why many of you obtained your licence. It is more enjoyable if you can operate in comfort. Whether you already have a station (possibly from an interest in listening or CB), or have yet to establish one, this article should provide a few tips. Few original ideas are presented; most come from a blend of experience and reference to the standard handbooks.

Location

Overseas, many amateur shacks seem to be in basements or attics. Unfortunately, this option is not available in most Australian houses. Backyard sheds or spare rooms are the popular choices here.

Both locations have their benefits and drawbacks. A garden shed means that radio equipment can be co-located with a workshop. As well, less feedline may be required than if the operating location was inside the house. This reduces both costs and signal loss, particularly on VHF/UHF. Noise

from crackling radios (outside) and household members (inside) may also make a stand-alone outside shack more attractive. Yet this very advantage has its problems in some situations, and some amateurs have had to install intercom systems between the shack and the house.

An indoor location has advantages, particularly in areas where extreme temperatures are common. Security may be better if equipment is kept inside the house. Access to power and telephone connections (if needed) may also be better indoors. However, it is usually more difficult to route feedlines and cables, and provide a short, direct connection to the station earth. Whatever location is chosen for the operating area, it should be well lit. Because of the potential of fluorescent lights to cause interference, incandescent lighting is suggested.

Furniture

Most operating positions are built around some form of desk or table. However, the use of a cabinet with lockable doors may be safer if there is a danger that equipment may be accessible to prying fingers. This scheme

may be aesthetically more pleasing too, particularly if the operator has little choice but to use the corner of a kitchen, bedroom or lounge for a "shack".

An operating desk should be deep enough to allow sufficient space in front of the equipment for microphones, magazines, headphones, pens, etc. It should incorporate one or more shelves, for books, measuring equipment and station accessories. Having two or three drawers is an advantage. Some amateurs have successfully used an old door for a table top. While the natural impulse is to have it against the wall to maximise room for the operator, this might not always be the best plan. A better idea could be to place it a metre from the wall. This allows the operator easy access to the back panels of equipment without having to disconnect equipment and move the table.

Equipment Layout

The layout of the equipment depends very much on the operator's main interests. Equipment should be positioned so that frequently used items can be used without leaving the chair or reaching over other pieces of equipment. Questions that could be asked when arranging equipment include:-

- Are the operator's interests primarily in HF, VHF, Morse, voice or digital communications?
- Is the operator left or right handed?
- How important is the computer to station activities? To what extent does it cause interference to receivers?
- Is there a separate space for constructional activities, or must these be done at the operating desk?
- Must the operator be able to change bands and/or antennas quickly?

Some amateurs mount equipment behind a console. While this looks impressive, it can prove inflexible if equipment or interests change. The effort involved is not inconsiderable either. It is suggested that beginners start simply with a desk and one or two shelves, rather than a console. Second-hand or ex-government furniture is recommended; more money can then be spent on equipment, components and QSL cards! Figure 1 shows what a well-equipped station, able to operate on all Novice bands, could look like. Further ideas can be obtained by visiting club stations or other amateurs. Particularly look for the way that they have solved common problems such as bringing feedlines inside and earthing. Their solutions may be of use in your own situation.

Wiring

It is assumed that mains voltage is available at the operating position. If not, a licensed electrician will be required to install the extra wiring required. One or two more

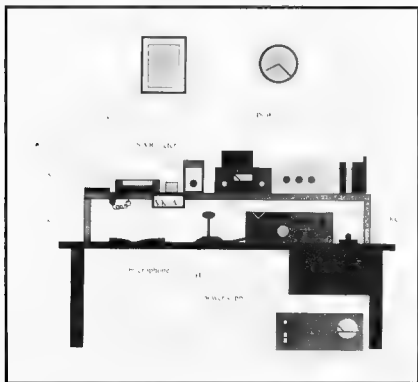


Fig 1 - Possible station layout.

positive

The polarity given is a guide; some may use the opposite polarity. Individuals should use one polarity only on all their equipment.

negative

Fig 2 - A low voltage T-connector.

power points than you think you'll ever need would not go astray. Alternatively, one of the multi-way power distribution boards could be used, if current ratings are observed.

The area behind the equipment is a veritable jungle in many shacks. It is often inaccessible and ill-lit, increasing the chance of error when changing connections to a piece of equipment. Cables should be labelled, as equipment damage can result from a wrong connection. Further information on labelling is given elsewhere.

All wiring in the shack is likely to be at the twelve volt level, unless very old valve equipment with separate power supplies is being used. Transceivers may have their own in-built supplies, or a high current 240 to 12 volt supply may be used to power the station. It is desirable that the supply be fitted with high-current polarised sockets, rather than simple binding posts to reduce the risk of the wrong polarity when connecting equipment. The T-type plugs and sockets (Fig 2), used in commercial low voltage systems are recommended. Power leads to transceivers should be thick and reasonably short to minimise voltage drop on transmit. Insulated automotive-type wire is suggested.

A difficulty for many people is finding a means of bringing feedline into the operating area. This is particularly true for VHF/UHF stations, where the use of the thick RG-213 cable (or better) is desirable to reduce losses. RG-58 is somewhat easier to bring indoors. Open wire feeder has its own problems; unlike coaxial cable, it is not good practice to run it near metal objects. All of the following

have been used by amateurs to bring feedlines inside:-

- through a ceiling ventilator;
- through a piece of wood mounted in a partially-opened window;

- through a short length of 50-75 mm PVC pipe mounted in the wall;
- through a louvre window; and
- under the house and through a hole drilled in the floor boards.

Other ideas no doubt suggest themselves to the reader. Any solution should:-

- not compromise household security;
- not increase the opportunities for vermin to enter;
- not cause antennas or feedlines to run near power lines or lead-ins;
- not impair operator comfort by reducing heat insulation;
- be reversible should the property be sold (or inspected by landlords);
- place as little stress as possible on incoming cables, and
- be amenable to expansion.

Earthing and Safety

Have you ever felt a slight tingle when you touched the front panel or case of your transceiver whilst operating? If so, you have observed the effects of poor RF grounding. Effective RF grounding provides a low-resistance path to ground for any stray RF that may be floating around the shack. This reduces the chance of causing interference and the risk of RF "bites" from microphones and front panels. An RF ground consists of a direct connection from all equipment cabinets

Novice Plus - Helping You Get More from Amateur Radio

Novice Contest This Month

A reminder that the VK Novice Contest is on later this month. The contest exists to promote activity in the 80, 15 and 10 metre Novice segments. If you have not entered a contest before, this contest is a good place to start. It takes place over the weekend of June 20/21. Rules appeared in the May 1997 issue of *Amateur Radio*, page 37.

Labelling Leads

In many radio shacks, there is a plethora of leads behind the equipment. It is very easy to make mistakes when changing connections. In extreme cases, this can lead to equipment damage; for example, when full power from a transceiver is applied to the antenna socket of a receiver. Cables should be labelled to minimise this risk. A good way is to write (with a ballpoint pen) labels onto strips of paper 5 mm wide and as long as the label requires. Clear adhesive tape is placed over the front of the label and around the cable. The tape is then continued so that it sticks to the back of the paper and around to the front of the label, where it is cut with scissors. The result is a descriptive "flag" at the end of the cable near the connector. A refinement could be to write on both sides of the paper strip instead of one.

Easy Equipment Feet

To prevent equipment scratching your operating desk, it is a good idea for all gear to have rubber feet on the bottom of the box. Unfortunately, commercially-made feet are quite expensive. However, it is possible to make your own for very little effort.

Simply purchase a strip of 4-5 mm thick rubber from a swimming pool supplies shop. You won't need much; a one metre by 10 cm piece will last for years. With a pair of scissors (or Stanley knife and metal ruler), cut the rubber into squares. For small accessories, one centimetre squares are acceptable, but use bigger sizes for larger equipment. Glue a square near each corner of the base of the box. Before gluing, you may care to bevel the edge of the feet with sandpaper for a more professional appearance. That's it - now you can afford to have feet on all your equipment without spending a small fortune.

Novice Notes on the Net!

To increase the exposure of Novice Notes columns to new and prospective amateurs, selected articles are being made available via the Internet. The new service, called Novice Notes Online, fills a gap in the provision of information to new amateurs. Already it contains material on operating, packet radio, VHF, homebrewing, buying equipment and more. Links are also provided to WIA and SMA home pages. If you have Internet access, visit Novice Notes Online today. You will find it at URL <http://www.pcug.org.au/~parkerp/nonline.htm>

Peter Parker VK1PK

Packet World

Grant Willis VK5ZWI*

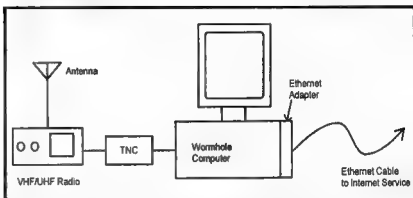


Fig 1 - The hardware required for an amateur packet wormhole station.

Introduction - Amateur Packet Radio Wormholes

This month I commence a series looking at one of the more interesting activities to hit amateur packet radio in many years, the international amateur wormhole network. A "wormhole" is a type of amateur packet station which links to other amateur packet stations via a third party medium, often the Internet. This series will cover some of the basic principles of their operation, how to use them and what is possible on the worm hole networks.

How Wormholes Function - A Layman's View

An amateur packet radio wormhole station requires similar equipment to a BBS or Node station. Typically, a wormhole will have a

computer (usually a 386 or better) with the usual hard disk, memory, monitor, keyboard, etc, a packet TNC, a transceiver and power supply, an antenna and, to provide the Internet link, typically an Ethernet Adapter (Ethernet is a computer interconnection system running at 10 Mbit/s using 50 ohm coax cable).

For the wormhole to work it must be located where it can access the Internet. As a result, they are often operated from within universities in conjunction with the computing engineering or science faculties as experiments in alternative forms of computer networking, managed by amateur operators within those institutions.

An amateur wormhole station utilises the TCP/IP packet protocols which were originally developed by the American

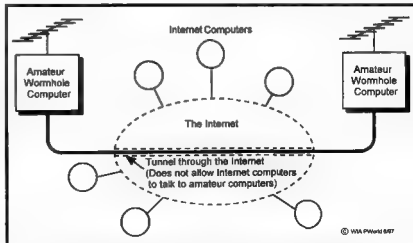


Fig 2 - Amateur wormhole station to amateur wormhole station communication via the Internet. Note that the tunnel through the Internet does not allow Internet computers to talk to amateur computers.

to an earth stake outside the shack. For best results, the lead between the equipment and the earth should be as short and stout as possible. Braid from a length of dissed 50 or 75 ohm coaxial cable is ideal for this application. The cable's inner conductor is not used and can be disregarded.

In some situations, a short, direct connection to ground is not possible. An acceptable substitute can be made by running quarter-wavelength pieces of insulated wire from the transceiver. At least one wire per band is required. For the Novice, lengths of 2.5, 3.5 and 20 metres will suffice (being quarter wavelengths on 10, 15 and 80 metres respectively).

Amateur stations are safer today than they were thirty years ago. However, accidents can still occur. Precautions that should be taken include:-

- Use wire sizes and insulation commensurate with the current carried;
- Have a carbon-dioxide type fire extinguisher available near the shack;
- Inform others about the location of the station's main power switch; and
- Have family members able to perform cardiopulmonary respiration.

This list is not exhaustive, and can definitely be added to, especially if the shack includes high-powered amplifiers, high voltage power supplies (particularly those not contained within equipment). Reference 1 provides further information on electrical safety. Details of first aid in case of electric shock are given on the back cover of the WIA Call Book.

Reference

1. ARRL, *The 1988 ARRL Handbook for the Radio Amateur*, American Radio Relay League, Newington, CT, 1987.

*7/1 Garran Place, Garran ACT 2605
VK1PK @ VK1KCM.ACTAUS.OZ

Department of Defence in the 1970s. These are the same protocols which are used on today's Internet computer network.

A typical wormhole station uses TCP/IP to pass amateur radio packets to other wormhole stations via the Internet. To do so, a wormhole sets up a "tunnel" through the Internet which is then used to pass amateur radio traffic to other known amateur stations on the same network. The tunnel is established by the software running on the wormhole computer and, once established, will only allow information to be passed between manually configured amateur wormhole stations, ignoring all other information on the Internet (see Fig 2). A more detailed description of the packet formats is given in the sidebar.

What Can Wormholes Be Used For?

Extending the Range of Networks

One of the original aims that led to the design of the amateur packet radio wormhole system was to interconnect the amateur packet radio TCP/IP network (Network number 44) so that existing small pockets of this activity scattered around the globe could communicate with each other. Amateur packet radio TCP/IP stations (using NOS or similar software) in one city where a wormhole existed were then able to have real

time communications with their amateur counterparts in other cities and countries where there were wormholes too.

Amateur TCP/IP stations using wormholes today are able to have "telnet" (terminal style) connections with other amateur stations around the globe using very simple one-step commands. Many other features and powers of the TCP/IP protocols are able to be experimented with as a result of wormholes, including the routing, name serving and other services and activities. Wormholes are providing a bridge for amateurs to learn about computer networking and enter what, to some, is a fascinating aspect of digital communications.

From this simple beginning techniques were developed for linking all sorts of amateur packet radio systems together. One of the early extensions of wormhole technology was to adapt the tunnelling (encapsulation) to wrap amateur AX.25 packets inside Internet TCP/IP ones. This allowed amateur packet stations who were not running the NOS software and TCP/IP protocols to also access the wormhole's real time communications abilities over distances far greater than any existing VHF/UHF system would allow. This was achieved by the wormholes providing digipeater style interfaces between wormhole radios via the

Internet. These types of circuits are nicknamed "AX-IP" routes, because of the way they tunnel AX.25 inside TCP/IP packets.

Other protocols soon followed, with NET/ROM protocol connections being built into the wormhole software, which could then inter-link regional NET/ROM networks together. This removed the unwieldy digipeater interface and replaced it with something most packet operators were familiar with. Recently, the Rose X.25 amateur radio networking protocol has been adapted to wormholes which will allow the inter-linking of regional Rose networks in a similar fashion to the NET/ROM networks.

All of these different protocol systems, linked using wormholes, provide real time communications between amateur packet stations around the globe. This would never have been possible in the amateur community unless we developed our own geostationary satellites (something which is prohibitively expensive at present). All of the adaptations of amateur packet radio protocols for wormhole usage have provided a huge area of experimentation within the amateur packet radio community, and provided a number of advances in computer networking techniques.

Expanding the Range of Activities in Amateur Packet Radio

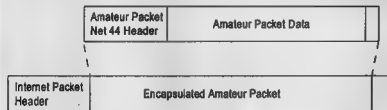
Other examples of experimentation in new services, and adapting old ones, include the world wide Converse network provided via the wormholes. The Converse network allows amateurs to connect to their local wormhole computer via packet radio, and have real time conversations with other amateur stations around the globe. The protocols driving the Converse system, while based in the Internet IRC style of system, were developed within amateur packet radio circles (a look at how to use the Converse network will be presented in the next *Packet World*).

A further example of how the wormholes have developed a service is to look at the DX-Cluster networks. DX-Clusters have previously not been hugely popular in VK, possibly due to the cost of the software and the lack of available long distance networks to interconnect them. Free or shareware software is now appearing and, with the advent of the wormhole systems, DX-Cluster inter-capital linking becomes feasible.

In some areas, wormholes are set up solely for packet BBS mail forwarding use. In the case of transporting international bulletins between continents, wormholes provide an invaluable resource as the amount of traffic on the global amateur packet BBS network today would completely swamp the HF bands with digital signals and totally

Setting Up the Tunnel - Wormhole Packet Formats

Amateur packets are placed in the tunnel between wormhole stations by taking an amateur packet received from a radio interface, and wrapping that packet up in its entirety inside an Internet packet. That Internet packet is then forwarded to the destination wormhole computer, which will then unwrap the packet and send the original encapsulated packet out on the radio.



Internet computers can't access the amateur data because it is inside another packet. Likewise, amateur stations can't access Internet computers because their packets are never decoded by the Internet. For communications to take place, both ends of the connection need to be manually configured to accept the special Internet packets containing amateur packets. There are several security systems which are used on wormhole stations to prevent any unauthorised access between amateur and Internet systems.

There are several pieces of software which can perform this tunnelling, including the amateur xNOS packages as well as the Linux operating system. The overall level of functionality of a wormhole is very much determined by the type of computer and the operating system it is using.

overload the satellites. However, the trend towards installing wormholes instead of reliable VHF/UHF facilities should be avoided if at all possible.

Wormholes are still experimental devices and they do rely on third party systems. They are fun to experiment with and great for allowing real time long distance packet radio network, but the bulk transfer of BBS mail, at least within regions where VHF access is possible, would be better served and be more reliable in the long term if amateurs continue to invest time and effort into building VHF/UHF networks. Likewise the wormholes should not be the first choice, in my opinion, for domestic mail and bulletin transfers where there are HF routes available. The data speeds available on the radio ports of most wormholes are not great and would be, I feel, better utilised teaching people about computer networking and being used for real time keyboard type communications. Wormholes for domestic traffic should be a second choice where there are alternatives available.

Linking to Non-Amateur Networks

One of the most common questions asked about wormholes is "Can I access the Internet from a wormhole station using my packet radio station?"

No, it is not normally possible to access any Internet computers from an amateur packet wormhole and it is definitely not possible to access the Internet once your packets are encapsulated and in transit. There are a few instances where limited Internet services are available from some wormholes (usually from overseas wormholes where the amateur regulations are different) but, on the whole, Internet access is not available from amateur packet radio stations.

The amateur wormhole stations in Australia are unable to provide Internet access from packet radio, or access to packet radio from the Internet. This is because of the regulations which determine the content of amateur transmissions, and the regulations concerning the control of amateur transmitters. To ensure this, Australian amateur wormhole stations only talk with other amateur wormhole stations in Australia and around the globe.

Conclusion

In the next *Packet World* I will take a detailed look at how to use the real-time conference networks available via wormholes, and also explain some of the methods for logging in and what all the commands are and how they can be used.

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Packet: VK2JW1 @ VK5TTY#ADL.#SA.AUS OC
Internet: gwollis@dove.mtx.net.au

Pounding Brass

Stephen P Smith VK2SPS*

VK2DER de VK2SPS GA OM es Tks fer call, VY nice sig hr today. Ur RST 599 599, name hr Steve Steve es Qth Newport. Hw cpy? VK2DER de VK2SPS KN.

Does the above sound familiar? This basic QSO scenario is being played out by telegraph operators the world over, but first glance by a beginner and he would be very confused indeed by the number of abbreviations used unless he had some basic training.

Abbreviations are used mainly in telegraph work as a means of shortening words and, in some cases, sentences so that the maximum amount of information can be transmitted in the shortest possible time.

In 1879, Walter P Phillips published a comprehensive list of abbreviations which was widely used by telegraph operators of the time. He named his publication the "Phillips Code" This publication became the telegraph bible to all commercial operators. Some organisations, especially the news services, could clear in a day's shift anywhere from 15,000 to 16,000 words, depending upon the operators' ability. Operators usually were paid per word.

Abbreviations used today are descended from the Phillips Code, modified slightly from landline American Morse to Continental Code as used by radio amateurs today. Some abbreviations have stayed with us whilst others have passed on with time.

Some of the most common abbreviations which you will encounter, especially during a basic QSO, are: U = You; Pse = Please; Cpy = Copy; Ur = Your; Vy = Very; Hr = Hour; Tk = Thanks; Ga = Good Afternoon; Sig = Signal; Fer = For; Gm = Good Morning; WX = Weather; Es = And; Ge = Good Evening; Temp = Temperature; Abt = About; Hw = How; Rig = Tx/Rx; Omi = Old man; Rpt = Repeat; YL = Young Lady; RST = Readability, Signal and Tone; Ant = Antenna;

Lw = Long Wire, Vert = Vertical, 2EI = 2 Element; Gp = Ground Plane, Dple = Dipole; and Inv = Inverted Vee.

These are just some of the very common abbreviations encountered. Some other very common expressions are used as salutations. Ones which come to mind include "CUL" for "see you later", and "BCNU" for "be seeing you". "FB" is commonly used standing for "fine business" and is used as a form of compliment.

Abbreviations should be used where possible as they make life easier for both parties. Use a common sense approach to abbreviations and don't become a slave to them. Don't use abbreviations of unusual form as this sometimes creates difficulties for the other operator.

A good approach to follow is "when in doubt, spell it out".

One important point for beginners is the use of letters substituted for numbers, especially in contest situations. The letters are "N" and "T". The letter "N" is often substituted for the number "9" and "T" for the number zero (0). For instance, "599 001" (a contest number exchange) would be sent as "5NN TT1". Be aware of this. I recommend sending 599 (numbers) for normal QSOs and the letter/number combinations during contests.

A publication I highly recommend to all telegraph operators is **Radiotelegraph & Radiotelephone Codes, Prowards & Abbreviations** by John W Alcorn VK2JWA. It has taken John nearly 10 years to compile this book which is filled with a wealth of information. It is soft bound and A4 size with approximately 90 pages. Some of the chapters cover: Q-Code, Z-Code, Radiotelegraphy Abbreviations, Telegraph Transmission Codes, Machine Codes, Phillips Codes, Phonetic Alphabet and much more.


This book is a must and, selling at under \$AUS20, is very good value. Well done John for an excellent book.

Further details can be obtained from: John W Alcorn VK2JWA, 33 Spring Street, Lismore NSW 2480, phone 066 215 217

John is seeking information on the Heliograph Link between Cairns and Coffs Harbour. I'm quite sure a lot of readers will be able to assist John with this information.

Next month we will look at "Buying a Morse Key".

*PO Box 361, Mona Vale NSW 2103



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ar

QSLs from the WIA Collection

Ken Matchett VK3TL* Honorary Curator WIA QSL Collection

W1EH

Whilst sorting out several thousand QSLs from the USA I was suddenly struck with the name on what looked like a very ordinary QSL card. The name of the sender was K B Warner and the card was dispatched from West Hartford, Connecticut.

Most hams will be familiar with the name of Hiram Percy Maxim, the founder of the Radio Club of Hartford, Connecticut, which in 1915 was to become the ARRL (American Radio Relay League.) This body of radio amateurs was truly a relay league, each with a commitment to relay messages across the country.

Relay was, of course, a necessity since the spark transmitters of those days had a very limited range indeed, despite their high power. It was Lieutenant Kenneth B Warner who became the first paid secretary of the ARRL in 1919 and who was given the responsibility for ensuring the success of a newly-published magazine called *QST*. In 1925, when Maxim became the first president of the IARL, it was Kenneth B Warner who became its first secretary.

EA9DD

This QSL, one of a half dozen or so Rio de Oro QSL cards held by the WIA was, before its deletion as a DXCC country, one of the most sought-after cards. Rio de Oro (literally, River of Gold) was the coastal region of Spanish Western Sahara and became deleted after Spain relinquished control over the territory in 1976.

The territory is now part of "Western Sahara" (The Saharan Arab Democratic Republic, RASD).

GB60BBC

The first broadcasting service in Britain began in 1922 and was run by the British Broadcasting Company, a group comprising major radio manufacturers. It was taken over in January 1927 by the British Broadcasting Corporation (BBC) under royal charter.

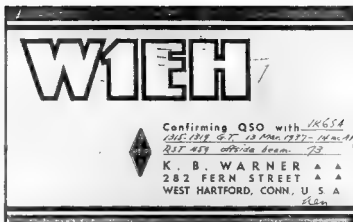
On 2 November 1936 the BBC introduced the world's first high definition television service. The special QSL shown, GB60BBC, (GB sixty BBC) was used by members of the Ariel (BBC) Radio Group throughout 1996 to celebrate the 60th anniversary of this event. Once most conservative in its issue of special call-sign prefixes, Britain has issued over a dozen numerical GB prefixes.

Thanks

The Federal body of the WIA would like to thank Roth VK3BG, Geoff VK2UB, and Brian VK4LV for their kind donation of QSL cards. Also the family and friends of SKs Sam Watson VK6WW and Selwood (Jim) Austin OA6SA/VK6SA, both courtesy of John VK6XJ and John Holmes, President of the "Vintage Wireless and Gramophone Club of WA"

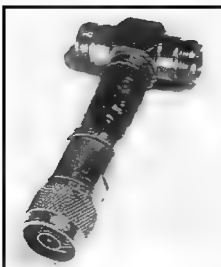
*4 Sunrise Hill Road, Monrovia VIC 3765
Tel (03) 9728 5350

AR



Repeater Link

Will McGhie VK6UU*



De-sense adapter.

4027 Update

The latch circuit in *Repeater Link* for March 1997, page 45, received some helpful suggestions from Les VK2KYJ to improve its reliability and operation, particularly the false triggering that occurred when a relay is attached, requiring the 150K and 10 nF capacitor from pin 15 of the 4027. Les has some good ideas you might like to incorporate into the design. If you make the changes, let me know how they work. Thanks, Les, for taking the time and interest to improve the circuit.

VK2KYJ Modifications

1. Place a diode (anode to ground) in parallel with the 12 k resistor. This will ensure that the 5 μ F capacitor is quickly discharged when power is removed, without giving the input protection diodes a hard time.

2. Try a Zener (say 15 V) in parallel with the BC337. The diode, as published, won't do anything to suppress the back-EMF spike from the relay which actually goes more positive (until the BC337 breaks down). Alternatively, connect the diode across the relay. You could also try a series RC (snubber) across the relay (say, 10 ohms and 100 nF). Another variation on this theme is to connect a Zener (say 15 V) from collector to base so that the transistor switch-off is controlled by the back-EMF spike. This partly depends on the base drive resistor.

3. Add a Schmitt trigger inverter between the 3.9 k/20 nF and the clock input. The 4027

data I have says the maximum rise time for the clock input is about 5 μ s. The 3.9 k/20 nF is probably a bit marginal. 74C14 (six inverters) or 4093 (four NAND gates).

4. The article claims that the BC337 will switch "over half an amp". My data (Philips) says that at 500 mA, DC current gain > 40. The 2.2 k can't supply enough base current at 12 V for a worst case BC337. The data also says that 500 mA is maximum continuous, 1 A peak. Reducing the 2.2 k to about 820 ohms would fix this, but then the 150 k is too big.

5. Suggest changing the BC548 to an emitter follower configuration so that the BC337 base drive resistor is not consuming power in the quiescent state (I guess it depends on which state the output spends most of its time); or use a FET such as a VN10KM (200 mA maximum over temperature specification) for the output device and you probably won't need the BC548.

6. The 18 k pull-up would be better if it went direct to the input side of the 3.9 k, as it stops the voltage at pin three from falling below about 2.1 V, assuming the input actually pulls down to zero.

De-Sense Testing

One of the fundamental tests required on a repeater is a de-sense test. Is the repeater's transmitter de-sensing the repeater's receiver? Inject a weak noisy signal into the repeater's receiver and turn off the repeater's transmitter. If the noise in the repeater's receiver reduces, then the repeater's transmitter is de-sensing the repeater's receiver. A simple but important test and there are a number of ways of obtaining the weak signal.

Ask any amateur to provide a weak signal for the test. This can work, provided you can find the right signal level. An even simpler method, is to take the antenna off a hand-held at the repeater site and, while it is on transmit, move the hand-held around until you find a weak signal into the repeater. This works but is not much use for accurate testing and alignment of a repeater for zero de-sensing. What is required is a variable signal level that, once set at a given level, remains at that level.

What is most important for adjusting a repeater/duplexer, is that the test signal has to be applied at the antenna port of the duplexer. If the test signal is able to enter the receiver path at any point other than the input, then the duplexer and/or the receiver can be misaligned.

But how can you apply a signal generator to the duplexer antenna port and turn the transmitter on, remembering the repeater's transmitter goes through the duplexer and appears at this same point, without blowing up the signal generator? The answer is a simple attenuator between the antenna duplexer port and the signal generator.

De-sense Adapter

The de-sense test adapter, shown in the diagram and photo, connects between the antenna duplexer port and the antenna or power dummy load. There is no loss between the duplexer and antenna, but about 30 dB isolation between the duplexer and test signal source. This attenuation is made up of four 27 k 1/4 watt resistors connected in parallel to give 6.75 k, and two 100 ohm 1/4 watt resistors connected in parallel to give 50 ohms.

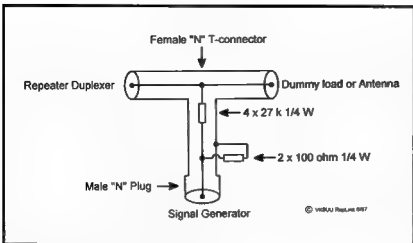
The diagram shows how the resistors are connected to give the 30 dB isolation between the duplexer and the test signal generator. You can use a 6.8 k resistor in place of the four 27 k resistors and a 56 ohm resistor in place of the two 100 ohm resistors. I found it easier to fit the parallel combinations inside the adapter, and the parallel combinations may provide better wide-band operation of the adapter. Use 1/2 watt resistors if you use the 6.8 k/56 ohm combination.

The attenuation that this adapter introduces between the signal generator and the repeater has to be overcome by increasing the signal level out of the signal generator by some 30 dB. The isolation protects the signal generator, reducing the repeater's transmitter by a thousand times, so 20 watts becomes 20 milliwatts. This level is safe for connecting to a signal generator. Extra attenuation can be added if you have any concern.

With the signal source connected to the adapter, and adjusted to give a weak signal, adjustments can be made to the duplexer and the repeater's transmitter and receiver for zero de-sense. While using this adapter to set up a UHF 70 cm repeater for zero de-sensing, I found improvements could be made with the transmitter's noise output and the receiver's best sensitivity, along with the best performance of the duplexer.

The adapter is made from an N type female T connector. Solder the 27 k resistors onto the centre pin of the T connector. The other end of the 27 k resistors goes to a male N type plug. This end of the 27 k resistors is also the connection point for the two 100 ohm resistors to ground. I found that an N type male plug, terminated with RG-213 coax with the coax cut to about three centimetres long, was the best way to put together the adapter.

The braid of the RG-213 is folded back



Schematic of the de-sense adapter.

and the centre conductor of the RG-213 is cut short to allow the 27 k resistors to be soldered to it. The two 100 ohm resistors are then soldered to earth, either to the braid of the RG-213 or to the T connector, whichever you find the easiest. Cover the resistors with heat shrink or insulation tape and then fold the braid back down to the T connector and solder the braid to the T connector outer. The attenuation resistors are then shielded by the RG-213 braid. Tape over the braid and you have a simple but very useful adapter for testing de-sensing and aligning repeaters.

29 MHz Again

To keep you up to date on our licence application for a 29 MHz gateway on to one of our existing 2 metre repeaters in VK6, there is still no licence. The formal

application went into our local VK6 WIA Council three years ago. Since then there has been a host of delays. I'm not having a go at anyone, or the WIA or SMA, because I have seen how the delays take place and have been part of the delay process as well. But we really do have to do better!

The bureaucratic process is mind numbing. Why such a simple application can take three years so far is the result of silly regulations, lack of clear regulations, lost applications, misplaced applications, people forgetting, letters going unanswered, people being on holidays; the list goes on! What I would like to know is how do the Eastern States do it?

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Spotlight on SWLing

Robin L Hanwood VK7RH*

It has been announced that another major short-wave broadcaster is permanently closing down. The Christian Science Publishing Society, which publishes the respected Boston weekday newspaper, *The Christian Science Monitor*, has placed their short-wave senders in Cypress Creek, South Carolina and on Saipan in the western Pacific, on the market. They also announced that they will be no longer producing their newscasts over the American Public Radio Network (PRI) as from the 30 June

Many of us have come to rely on Monitor Radio International for their balanced news reports and current affairs presentation and it

will be a pity to see them go. The weekday transmissions were run separately from the weekend releases which were produced by the Christian Science Church. In its press release, and on media interviews, it was stated that MRI was a commercial operation and consistently failed to recover costs from advertisements and was subsidised by the Church. Some years ago, the station sold the sender at Scotts Corner, Maine to a splinter Adventist group in Florida.

At the time of compiling this, there has been no further news on the fate of the two transmitting sites, although rumours are that the Radio Free Asia operation in Washington

could be a possible buyer of the Saipan site. Commercial operation over short-wave has never taken off compared to MW or FM.

Also, recently Joseph Costello died in New Orleans LA aged 53. He started the short lived revival of commercial short-wave broadcasts over WRNO, "The Rock of New Orleans", by breaking the monopoly and reluctance of the FCC to issue new licenses.

The majority of short-wave broadcasting licences issued over the past 20 years in the USA have been to religious stations broadcasting a veritable potpourri of different religious and political viewpoints. Perhaps the easiest heard is WWCR in Nashville Tennessee, which has expanded to four transmitters on-air simultaneously. Its programming has come under scrutiny since recent terrorist events within North America after it aired various program blocks from patriot and self-styled militia groups.

However, WWCR is a commercial operation and several of these groups were no longer heard when they did not pay for their airtime. Another interesting trend is that some international and foreign domestic networks are hiring airtime over WWCR to reach North America. The Croats were the first during the Yugoslavian civil war in 1992-3, and others followed. Now the Irish RTE network broadcasts to this region at 1000 UTC over WWCR for 30 minutes. Weekend programming is longer but is aired, I think, at 1100. Frequency is 5070 kHz.

The future of Radio Australia is still unclear. A few weeks ago, it was announced that three language services of French, Thai and Cantonese will close and staffing levels will be further reduced to about 80. Personally I find that axing Cantonese is puzzling in view of the hand-over of Hong Kong to China at the end of this month. More people there speak Cantonese than Putonghua (Mandarin) as do many ethnic Chinese in SE Asia. The results of the Senate Select Committee in Australia's external broadcasting is expected to be handed down by now and it is unclear what their findings are.

Hong Kong will be reverting to Chinese sovereignty on 30 June and I am expecting that the hand-over will be extensively covered by many broadcasters, including the BBC World Service as well as the short-wave relays of the Chinese domestic networks. The actual time of the ceremony is 1600 UTC which corresponds to midnight local time. China Radio International should carry highlights on 1 July in their English program to Australasia on 11755 and 15440 kHz from 0900 till 1100 UTC.

There are presently no short-wave broadcasts emanating from Hong Kong since

the BBC closed down and relocated to Thailand. However, I would not be surprised if the Chinese put up a short-wave service similar to that in Shanghai, Fujian and other coastal centres. The Cable and Wireless HF maritime station VRQ/VRX will revert to Chinese control and the callsign block VRA to VRZ will also be released to China from the UK. This will mean that Pitcairn Island VR6 will be under a new prefix soon. The VOLMET broadcasts from Hong Kong at 15 and 45 minutes past the hour continue on 8828 kHz as does ATC traffic on 8903 and 8942 kHz.

In January there were rumours that HCJB was planning to erect a transmitter in north-western WA following an item in an obscure DX bulletin quoting the President of HCJB, Ron Kline. I was informed then, as were some other HCJB personnel, that this was just speculation. Now the secret is out, in HCJB Australia's autumn mailing to their local supporters, that an 80 hectare property at Kununurra in the Kimberley was given to HCJB with the aim of establishing an international short-wave station there.

It will be a long haul for there are still several obstacles, including the acquisition of a licence as well as obtaining equipment, particularly power generators. Already, disused Australian military transmitting towers have been found before they could be sold for scrap and could be suitable for the site. In the meantime, the property will be used for Christian ministry through farming whilst awaiting further developments.

I was listening to the call back after the VK3BWI broadcast on 4 May, when I heard my name mentioned by Cohn VK3LO whilst in contact with Roth VK3BG. Thanks for the kind comments Col and Roth. I only wish I had an operational rig at the time. Roth mentioned that he regularly listens to Radio Netherlands in English at 0730 but gave the frequency as 7920 kHz. Sorry Roth. All there is on that channel is a facsimile station! I think Roth meant 9720 as that is where Hilversum was at that time, and also 100 kHz up on 9820 kHz. Both are from Bonaire in the Caribbean. However, the audio is deliberately not synchronised with one being about 600 ms behind the other!

Well, that is all for this month. Don't forget that there are plenty of signals on the 49 and 41 metre bands around 0200z coming via the South Pole from Europe. This only happens for a few short weeks so make the most of it.

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Internet e-mail: robnrv@iastie.net.au

Over to You - Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Morse and Exams

Steve Truscott's letter in *Amateur Radio*, May 1997 issue (*Morse Gone But Not Missed*) is lucid, and no doubt factual, but nevertheless substantially misses the point. We all know that commercial Morse telegraphy is uneconomic.

For instance, land-line Morse was phased out in Australia in the 60s, in favour of machine telegraphy (which could be worked at higher speeds by lesser skilled operators). That we are amateurs may have escaped the notice of some readers. According to the Macquarie Dictionary, an amateur is "someone who cultivates any study or art or other activity for enjoyment instead of professionally or for gain".

It is perhaps surprising to some members, but many of us actually enjoy using Morse, for its various operational and technical advantages. Have a quick listen on any DX band, especially when it is nominally "dead", and hear for yourself. CW is often the only "copiable" non-specialist mode.

Some persons, for various reasons, either cannot, or will not learn Morse. Fair enough. But I think it will generally be agreed that it is reasonable to expect that there should be some form of relevant practical skills test in addition to the theory and regulations in order to gain HF privileges. Without Morse as a "practical exam", it is difficult to know what to do.

Some alternatives have already been suggested. Let me add another, that the candidate may submit, to a suitably qualified examiner, a recent substantial radio project

which the candidate has successfully completed. S/he must be able to describe how it works, how it was made, with particular reference to any difficulties experienced, and how these were overcome. Or perhaps locate and repair set faults in a typical transceiver. I can already hear howls of "unworkable"! Really? It works in the TAFE courses. Would it be any more difficult to administer than the present Morse exam? "Easy got - soon forgot".

Drew Diamond VK3XU
45 Gatters Road
Wonga Park VIC 3115

Regarding CW

The reasons for getting rid of CW appear limitless, the most dominant being that it is now obsolete in marine communications and the armed forces.

However, it must be remembered that all of those activities have nothing to do with the hobby of amateur radio. Nor do requirements suggest that, having passed the 10 WPM test (or 5 WPM for Novice), you ever have to use it again. Remember that in many other countries the CW exam is at 12 WPM with no errors!

Amateur radio is a world-wide hobby. The regulatory conditions are determined by international conferences, not by the comparatively minuscule number of amateurs here in Australia.

Les Daniels VK2AXZ
9 Highfield Terrace
Cardiff Heights NSW 2285

BT

VK QSL BUREAUX

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1	GPO Box 600 CANBERRA ACT 2601
VK2	PO Box 73 TERALBA NSW 2284
VK3 Inwards	Box 757G, GPO MELBOURNE VIC 3001
Outwards	40G Victory Blvd ASHBURTON VIC 3147
VK4	GPO Box 638 BRISBANE QLD 4001
VK5	PO Box 10092 Gouger St ADELAIDE SA 5000
VK6	GPO Box F319 PERTH WA 6001
VK7	GPO Box 371D HOBART TAS 7001
VK8	C/o H G Andersson VK8HA Box 619 HUMPTY DOO NT 0836
VK9/VK0	C/o Neil Penfold VK6NE 2 Moss Court KINGSLEY WA 6026

Technical Correspondence

All technical correspondence from members will be considered for publication, but should be less than 300 words.

Half Wave Antenna Formulas

After eavesdropping on some recent QSOs, may I suggest that the inexact and error prone formula for a half-wave HF wire antenna (468/F) enshrined in the ARRL Handbook is past retirement age and should be respectfully interred.

So am I, but I can still object.

In its day, this formula was no more than a conversion to feet with 5% deducted for "End Effects", or insulators and capacity to ground, etc.

Accuracy depended on wire size compared to height above ground and usually required a test and re-adjustment process to obtain a required 0.5% tolerance within a 2.5% bandwidth or thereabouts.

In this new age, we can refer to half the formula for wavelength (300/F) for a result directly in metres and, after test, subtract the percentage frequency error in centimetres direct from EACH half, viz a forty metre antenna of 10.5 m in each half can have 10.5

cm cut off both ends for each one percent error.

Unless you sell insulators, leaving out the obligatory "egg" insulator wired to a metal tower reduces the end capacity by 7 to 10 pF. To achieve this, one can use cordage of black polyester (Phillistran), carbon fibre (Kevlar) or, even the "el cheapo" polypropylene (UV proofed baling twine) laced on to insulated wire to reduce end capacity and span weight. An overhand knot, very close to each end for 100 watts, and maybe a 2 cm loop for 1 kW or so, should control the brush discharge to atmosphere and keep St Elmo and his mates from firing up.

The original formula served its purpose in the days of feet and inches, but why do the conversion, with the inevitable errors, when we have readily available metric tapes?

William McLeod VK3MI

42 Capon Street

Chadstone VIC 3148

ar

VHF/UHF - An Expanding World

Eric Jamieson VK5LP

TEP from Townsville

John VK4FNQ Townsville reports TEP on 7/4: "0455 BYTV 49 740 heard, 0458 JA1RJU CW 599 heard. From 0501 to 0538 worked JH7MSB, JH0MHE, 7M1FBN, JA1AUD, JK1DVX, JN1MKU, JA7QMH, JS1XGS, JH7DFZ, JA5FFJ, JE2DWZ and JA1RJU. Signals ranged from S9 to S1. Also heard JAs on 50.110 and BYTV for another 20 minutes then all faded".

Interesting Information

Doug Friend VK4OE reports that The VHF/UHF Field Day Contest in January did draw a few more people on to the low ends of the bands, but a competitive field station these days needs to be having as many FM contacts as possible to get anywhere. The Brisbane VHF Group station VK4IF/4 succeeded in winning the multi-operator section of the Field Day Contest this year.

"The first reason has been that large numbers of general Brisbane region stations were willing to contact VK4IF/4 on FM simplex frequencies (perhaps other clubs

also have accommodating/supporting locals, but there was a big increase this year in our area). The second significant reason was that VK4IF/4 and VK2FZ/4 also had the extra band of 2.4 GHz using equipment modules built by me

"I am looking seriously at having narrow-band capabilities on 10 GHz, in the not too distant future for home operation, and possibility for the field station as well. I do have a large amount of the necessary equipment ready to go. A small number of other Brisbane stations have also been proceeding slowly towards that end, so it is not all in vain.

"So that's about where I stand at the moment, Eric. I think that the most significant thing we can do is to keep publicising the good and challenging things that can be done and are being done by many people in the VHF/UHF world, and to present them in such a way that they do appear achievable without there being a need to be highly competitive. Thank-you for continuing to do your part. I'll be continuing to do what I can,

even though I am likely to become very busy again in a few weeks time."

Wally Howse VK6KZ writes that the following procedures have enabled 10 and 24 GHz contacts without any other liaison frequency

"These procedures involve using the minutes past the hour as the determiner of who shall transmit and who shall listen. As I am the odd character (that's my claim anyway), I transmit the five minute intervals starting with the odd five minutes - for example from 12.25 to 12.30. Neil VK6BHT being very even handed (my comment), then transmits the five minutes that start at 12.30 (even five minutes). We agree on our likely starting time but, if early or late, adhere to the above arrangement.

"If no signals are heard in the first ten minute period then we repeat the cycle and, unless we have a sniff of signals, generally close down after a total of 20 minutes.

"If signals are heard in any of the five minute periods then the next transmitting period of five minutes is broken with short listening periods to attempt to complete a contact."

Wal VK6KZ also sent the following: "Skeks with Bill Hockley VK6AS in Esperance by Cec Andrews VK6AO and myself have been extremely rewarding, with at least CW signals being heard most mornings. The skeks precede the continuing successful ones Cec and I have with Wally VK6WG in Albany on 144/432 MHz. By the way, these skeks are always on 144.120, as I argue that 144.100 is a calling frequency and pre-arranged skeks should be away from that spot! Bill is 598.8 km from my QTH in Perth."

The 17000 km Barrier

Steve VK3OT drew my attention to the fact that it appears, during Cycle 22, only three amateurs from VK broke the 17000 km barrier on the traditional VK/EU path. They were Steve VK3OT to G3UKV on 17/2/91 at 17084 km. Ken VK3AKK to G6JFJ on 18/10/91 at 17108 km. and Moss VK7IK to PA0LSB on 8/2/92 at 17053 km.

Also of interest is the contact between Mike VK2FLR who worked CU/N6AMG in the Azores on 27/11/91 at 19424 km, the Azores being in the Atlantic Ocean and about 1500 km west of Lisbon in Portugal. The path to there would be at a different angle from those directly into Europe.

Steve said: "It is very difficult to break the 16000 km plus path, particularly where eastern Australia is concerned. That extra 1500 km down from VK8 and northern VK4 comes at the price of station development and operator proficiency. In Cycle 22, very few long haul 16500 km plus contacts were made

operators with a knowledge of the band and the ability to use it, which also included making use of early warning signals in the area below 50 MHz. It will be just as hard in Cycle 23."

Steve VK3OT also advised that Toshi JA1ELY, Editor of *The 59 Magazine*, reports a new ten metre beacon JA7ZMA on 28.188 MHz from grid square QM07. It runs 50 watts from a stacked turnstile dipole at 700 metres asl. It may be a useful pointer to an impending 50 MHz opening.

From Gareth Davey VK1ANF comes the following: "Re the *Something Different* section in last month's *Amateur Radio*, I remember when flying in the circuit at Bankstown Airport (1000 feet above ground) about 10-15 years ago, that it was not uncommon to hear aircraft in the circuit at Norfolk Island making their radio calls (same frequency, I think 118.1 MHz), during the summer months."

One never knows what responses come to unusual statements. Thanks Gareth.

Microwaves

David VK5KK made a successful microwave outing on 13/4. He says: "Contact was made on 10368.100 MHz between VK5KK/p5 at Summertown (just north of Mt Lofty) at 1228 and Colin VK5DK/p5 at Cape Northumberland, who was accompanied by Trevor VK5NC. Signals were 5x5 both ways. Distance 385 km. Colin used a Qualcomm 10 GHz transverter with one watt to a 600 mm dish. VK5KK was running DB6NT with one watt into a 600 mm dish. Interestingly, signals on 144 MHz only averaged 5x1, with QSB, using 10 watts and a three element beam. 10 GHz signals were fluttery but more consistent! Signals were available on 10 GHz between VK5KK and VK5DK for the length of the test (till 1310) with little change in signal levels. Colin listened for the Adelaide beacon on 10368.45 MHz; however, did not report hearing anything.

"Keith VK5AKM was also on 10 GHz from his home QTH, however he did not hear Colin. VK5AKM uses a 600 mm dish at 13 metres with 250 mW. His location at Wasleys is about 60 km north of Adelaide, beaming through a saddle in the Mt Lofty Ranges. Signals between VK5KK/p5 and VK5AKM on 10 GHz (57 km path) were only 5x2 due to obstructions.

"At the same time, Russell VK3ZQB/p3 was at Pt Fairy. Signals were stronger from Pt Fairy on 144 MHz than from Cape Northumberland with both VK5KK/p5 and VK5AKM working Russell from 1220 to 1340. Various attempts were made on 10368.1 MHz from 1245, with some signals heard by VK3ZQB/p3 from VK5KK/p5 at 1310 and in the reverse direction at 1325, but signals did not peak long enough to establish contact.

"During the time of the attempts, Russell reported that the weather conditions at Pt Fairy changed from clear skies to heavy cloud as the front approached. Two metre signals gradually dropped after 1330. Weather conditions at VK5KK/p5 were typically damp with light rain that seems to exist with microwave openings at 600m asl, enough to get soaked. The rain had no effect on 10 GHz signals other than to scatter the beam heading about 10 degrees. Propagation was ahead of a front going through the bottom of SA/VIC ahead of a large high in the Bight (centre 1033 mb). Where were highs like this during summer?"

David VK5KK also sent this item from *The VHF/UHF/SHF Internet News*. It refers to microwave news from Sam Jewell G4DDK: "The 'cold' high pressure system on 8/4 and 9/4 produced excellent conditions on 24 GHz across the North Sea. Simon G3LQR, worked PA0EZ on 8/4 for what I think is the second or third time this year.

"On 9/4 I had my first QSO on 24 GHz with An PA0EZ for nearly two years. This was followed by an SSB QSO with Hans PA0EHG from his home QTH, for a new

"first" for me. The distance was a mere 225 km.

"Hans then left his Tx on for several hours whilst I monitored signal strength on my spectrum analyser (at 1F). In 3 kHz the signal reached 23 dB over average noise. With a lower noise figure, around 2 dB rather than my rather high 7.8 dB system NF at present, the signal to noise ratio would have been close to the magic 30 dB which would perhaps, indicate the possibility of a 47 GHz QSO. As more PA0 stations gear up for 24 GHz home station operation, the potential of 24 GHz to carry DX is becoming clearer. With a little more power and a greater number of stations QRV, I think we might be surprised by the potential of this great band."

News Brief

Andrew VK7XR reports that the scene has been quiet since the end of the Ross Hull Contest, only just making the regular early morning skeds to Ron VK3AFW and John VK3ATQ on two and six metres respectively. Usually 5x1 or 5x2.

"A slow moving high pressure system centred across Bass Strait for four days occurred from (UTC dates) 9/4 till 12/4. During this period of settled weather, numerous notings of beacons were recorded and various contacts made. Activity was low, but I guess everyone thinks the band is dead at this time of year."

9/4 2210 VK3CY 144 5x1 571 km Des;
9/4 2212 VK3AFW 144 5x8 439 km Ron;
10/4 2212 VK3AFW 144 5x5 Ron;
10/4 2214 VK3CY 144 5x1 571 km Des;
10/4 2217 VK3TWP 144 5x3 Max;
11/4 1156 VK2TWR 144 5x3 592 km Rod;
11/4 1203 VK2TWR 432 5x5 On FM;
11/4 1232 VK2XPG 144 5x5 Andy;
11/4 2226 VK3RGL 144 5x4 Beacon;
11/4 2227 VK3DEM 144 5x7 405 km Rob;
11/4 2236 VK3DEM 432 5x5 On FM;
11/4 2247 VK3DEM 1296 5x2 Rob;
12/4 0530 VK3RGL 144 5x7 Beacon;
12/4 0540 VK3ATQ 50 5x1 332 km John;
12/4 1050 VK3RGL 144 5x8 Beacon;
12/4 1058 VK3BWT 144 5x5 513 km Warren;
12/4 1128 VK3RTG 144 5x2 Beacon;
12/4 2110 VK3RGL 144 5x9 Beacon;
12/4 2111 VK3RTG 144 5x4 Beacon;
12/4 2112 VK2RBC 144 5x1 Beacon;
12/4 2235 VK2TWR 144 5x9 Very strong;
12/4 2238 VK2VZ 144 5x9 Bob;
12/4 2242 VK2TWR 432 5x5 On FM;
12/4 2250 VK3JG 144 5x9 400 km Brian;
12/4 2315 VK3TWP 144 5x9 358 km Max;
12/4 2319 VK3TWP 1296 5x1;
12/4 2324 VK3KLO 144 5x9 Charlie.

Andrew is doing very well considering he uses moderate power levels and basic antenna systems. He does not class his as a "super station", and so proves that results are attainable with a modest station if you work

**Have you advised the WIA
Federal Office of your new
callsign? Use the form on
the reverse of the Amateur
Radio address flysheet.**

at it. During the Ross Hull Contest he worked VK1, VK2, VK3, VK4, VK5 and VK7 on two metres.

On six metres, Andrew uses an Icom 551D at 100 watts to a six element Yagi NBS Style; and on two metres an Icom 290A at 120 Watts with a DL style 13 element. For 70 cm a homebrew transverter with 28 MHz IF at 50 watts is used to a 15 element NBS Yagi; and on 23 cm a homebrew transverter with 144 MHz IF at 10 Watts to a 20 element loop Yagi.

ARRL Headquarters

A special bulletin to all amateurs reports: ARRL Headquarters was saddened to learn that VHF pioneer and former QST VHF Editor Ed Tilton WHDQ, of Spring Hill, Florida, died on 1 March. He was 89. In December 1939, Tilton inaugurated the first QST column devoted to VHF. Originally called *On the Ultra Highs*, it eventually became *The World Above 50 MHz*. Tilton edited the VHF column until he retired from the ARRL staff in 1960, reporting on-the-air activity and encouraging experimentation, initially on the then 56 and 112 MHz amateur allocations and, later, on all VHF and UHF bands. The UHF DX Records box – the precursor of today's standings boxes – debuted in 1940.

During World War II, Tilton worked as a field engineer for the military on radar projects, mostly at Pearl Harbour and Guam, and became acquainted with the great technological progress the military was making in the VHF-UHF spectrum. Even while occupied with his military duties, he still managed to file occasional columns throughout the war years.

In 1947, Tilton established the first WAS standings box for six metres. In 1955 he proposed establishing the first calling frequencies for the six and two metre bands. Following his retirement, Tilton remained a QST Contributing Editor. He was the author of the ARRL's first VHF Manual and wrote numerous articles for QST.

Tilton's column inspired an entire generation of VHF and UHF enthusiasts and encouraged such activities as EME, meteor scatter and auroral propagation. He was considered an authority on sunspots and solar flares and their effects on propagation. As ARRL Executive Vice President David Sumner K1ZZ put it: *Ed Tilton was one of the outstanding amateur scientists of his generation. Perhaps more than any other individual, he led the exploration of the extended-range properties of the VHF and UHF bands.*

Tilton was a life member of the ARRL. He also belonged to the QCWA and the Spring Hill Amateur Radio Club. He was a native of Springfield, Massachusetts. His wife Leitha

died in 1995. His sister Ruby is among the survivors. He is to be interred in Canton, Connecticut. Donations in Ed Tilton's name may be made to the Hospice of the Florida Suncoast, 300 E Bay Dr, Largo, FL 34640. [End of message].

On behalf of the VHF fraternity in Australia, I wish to record our regret at the loss of Ed Tilton WHDQ, who accomplished so much during a lifetime of dedication to the promulgation of VHF/UHF for the community in general and amateurs in particular. His legacy to VHF/UHF is recorded in the various books and articles he has written, and his long period as Editor of *The World Above 50 MHz*. We salute you Ed, the great pioneer of VHF and above.

Internet Six News

The Worlds Six Metre Magazine for April, produced by Geoff GJ4JCD, has the following interesting snippets of information:

1/4: V73AT active again: New cycle, new opportunity. I have moved back to the Marshall Islands and will be very active during Cycle 23. The six metre antenna at the Kwajalein Amateur Radio club has been repaired and I am active starting today. Look forward to working you all during Cycle 23 from Kwajalein. QSL Manager is still K2CL. ... Tim McLaughlin V73AT (N2PC).

1/4: FR5 beacon QRT: I am advised by FR5DN that the Reunion Island beacon on 50.0215, FR5SIX, is no longer operational. No idea as to when it will be restored. ... Bill Hosie VK6ACY/Z55BBG.

7/4: VK TEP report: 49.750 MHz Vladivostok TV into VK4 via TEP at S3 from 0510 to 6/4 for 30 minutes. No amateur signals on 50 MHz or 28.885 MHz. ... Scott VK4JSR.

16/4: New Solar Data Link: A new link has been found on the Internet that provides up-to-date solar data. The map covers two months of solar data and can be found on the 50 MHz section of our main WWW pages. Here! or the short cut is Here!

16/4: King Island info de VK3OT: "Bob Jordan VK7JR was worked from King Island, Bass Strait, this morning. After a visit by VK3ATQ the quad antenna was repaired following reports of very poor signals. Bob is a blind op and drives an IC706 from a computer. Bob was Sx3 to Sx7 into Hamilton QF12 over a path of 300 km. It is unique in that he is at the intersection of four grid squares and four grid fields. This is the closest point for VK7 to VK3, being 59 nautical miles south of the Cape Orway Lighthouse in Bass Strait. Bob should be active most days at 0733 local time (2133 UTC), as well as Andrew VK7XR in Devonport, Tasmania."

19/4: Es in ZL: 0100 46.24 VKTV S2, 0440 VK7RAE beacon 519, 0440 46.17 TV up to S9 0442 0523 VK4RGG beacon 539. 0557 worked VK4AR, VK4JSR. TV carriers 46.17, 46.26 audible to around 0820z. ... Bob ZL3TY.

From the UK

Apart from daily contacts with G3CCH and intermittently with SM7AED, Ted Collins G4UPS, had rather a quiet month during March. Hence, he has been watching the 28 MHz beacons as pointers to possible six metre contacts.

14/3: 1200 HV43SJ/b 599 on six metres; 30/3: 1017 SM5SMH 5x7, 1021: OZ6VHF/b 569, 1030: ES0SIX/b 559; 31/3: 0805 heard OZ2LD 559 via m/s. That's it!

Web Page

Jim VK1ZFG advises that: "Strictly 6 – Australia's own six metre Web page – has recently been updated to include a list of all known six metre capable radio's, with individual links, to further info on the Net. Hope you find it useful. E-mail: CanberraBoy@msn.com".

Meteor Scatter Experiments

On the mornings of 3/5, 4/5 and 5/5, Adrian VK2FZ/4 set out to use the Eta Aquarids meteor showers for propagation of signals on 144 and 432 MHz. Adrian is about 70 km north of Brisbane near Maleny and 500 m asl in the Blackall Ranges. He sent out, via Rod Preston VK4KZR, a quite elaborate set of procedures for the tests, and they will be valuable for anyone wishing to try contacts via meteors.

I hope to include the procedures at some time, but information can be obtained by e-mail from Rod Preston VK4KZR rpreston@gil.com.au, Ron Cook VK3AFW cook@rivett.mst.csiro.au or general info from vk-whf@marconi.mpcpe.mq.edu.au.

To give you some understanding of what went on during those three mornings, this summary from Ron VK3AFW is worth reading.

Saturday, arm of 3/5:
5:15 to 6:30: Des VK3CY hears Adrian VK2FZ/4 and calls him frequently. Gavin VK2HY hears Adrian and calls to after 6:00.
6:08: Ron VK3AFW commences calling Adrian. QSO complete by 6:28:15. 26 reports both ways. David VK3AUU heard calling Adrian. Other stations known to have heard and called Adrian: Trevor VK5NC, Andrew VK7XR, Rob VK3DEM. Stations hearing Adrian but not calling – Alan VK3XPD, John VK3KWA.

Sunday, arm of 4/5:
Gavin VK3HY hearing and calling Adrian to after 6:15. 6:20 VK3AFW commences calling and completes QSO at 6:38 26

reports both ways 9:00 VK3AFW alerts several VK3 Aircraft Enhancement operators or listeners to the experiment. Max VK3TMP hearing and calling Adrian but runs out of voice before Adrian has his call copied fully. Doug VK3KMN calls after a couple of big bursts, but no luck. Telephone call from VK2FZ/4 to VK3AFW to say he's heard bits of signals but no positive ID of any call. Gavin VK3HY returns to the fray and, after 30 minutes, completes a QSO. Pings heard up to cessation of transmissions at 12:00 noon.

Monday, am of 5/5.

VK3XPD listening, VK3AFW starts calling at about 6:10. Partial QSO with VK2FZ/4, abandoned at 06:43. Adrian stops sending at 06:45. VK4ZKR and VK2FZ/4 copied many pings from the Canberra 2 m

beacon on Sunday morning. Several VK2s heard by VK3AFW for periods up to 10 seconds on 144.2 between 8:00 and 9:00 am Sunday.

"A very interesting experiment which introduced a number of people to MS for the first time. It was disappointing that the forecast meteor shower did not occur during these tests. It seems the prediction program got it wrong, as all QSOs and received reports were from normal random meteors. Ping rate was around four per minute here. In any one hour there were many pings lasting a second, and from one to three bursts lasting for five seconds each hour."

Next month I will include the remainder of Ron's information which covers the lessons learned, as well as hints for intending MS operators.

Closure

Several items have been held-over this month due to space limitations. I want to mention 50 years on 50 MHz soon. I already have input from Cliff ZL1MQ for his ZL view of that milestone.

By the time you read this we will be nearing the winter Es period, so watch six and two metres for those elusive contacts.

Closing with two thoughts for the month:

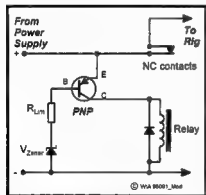
1. People who want by the yard but try by the inch should be kicked by the foot, and
2. Our faults irritate us most when we see them in others

73 from The Voice by the Lake

*PO Box 169 Menangle SA 5264
Fax: (085) 751 043
Packet: VK3SLP@VKS.WI.NADL.ASA.AUS.OC
E-mail: vk3slp@ozemail.com.au

AR

Update



Corrected schematic of the VK3EHZ over-voltage power supply protection.

Power Supply Protection

(Published on page 26 of the May 1997 issue of *Amateur Radio magazine*)

As well as other readers, John Bedwell VK3EHZ contacted us and advised that "Unfortunately, Murphy took over my first attempt and somehow you ended up with an incorrect circuit".

John's corrected circuit has been further corrected by Peter Gibson VK3AZL, *Amateur Radio's* Senior Technical Editor (who actually built it to ensure it would work), and is published herewith.

Peter offered the following comments:

1. R_{lim} limits the current into the PNP transistor, and 1.8 k Ω is a suitable value.
2. V_{Zener} sets the trip voltage which will be approximately $V_{Zener} + 0.6$ V.
3. Commonly available Zener diodes are

either 13 or 15 V, giving trip voltages of about 13.6 or 15.6 volts. Therefore, a 15 V Zener is considered to be the better value.

4. The diode across the relay can be any power diode with 100 or greater PIV.

5. For these voltages, a 12 volt relay works, although a small current limiting resistor could be put in series to limit the voltage across the relay to 12 volts.

It might be a good idea to correct your copy of the May 1997 issue of *Amateur Radio* now.

Conversion of Philips FM92 E Band to 1/2 Metres

(Published on page 9 of the May 1997 issue of *Amateur Radio magazine*)

The authors of this interesting article advise of omissions to the conversion project.

Firstly, the coil winding for Main and Offset in the VCO. The same gauge of wire and same direction of winding is used in both cases, the Main being eight turns and the Offset six turns.

Secondly, 10 pF NPO capacitors are placed across each coil in the VCO in Mark I

units; but only across the Main coil in Mark 2 units.

Finally, the output filter in the Power Amplifier needs changing.

Filter No 79 (see Fig 4)

FCO = 49.3 MHz, F3dB = 61.2 MHz, F20dB = 76.7 MHz, F40dB = 101.00 MHz, SWR = 1.03:1.

C1, C7 = 39 pF; C3, C5 = 100 pF; L2, L6 = 0.203 μ H; L4 = 0.251 μ H.

L2, L6 = 5 turns of 9.5 mm diameter, close wound, using 20 gauge (0.8 mm) wire.

L4 = 6 turns of 9.5 mm diameter, spaced one wire diameter, using 20 gauge (0.8 mm) wire.

It might be a good idea to insert a reference in the original article to this Update.

The DB-80, an 80 m SSB/CW QRP Transceiver

(Published on page 14 of the April 1997 issue of *Amateur Radio magazine*)

We have just received notification that the excellent, full-page drawings appearing on pages 15 and 17 of this article were drawn for the author Dr T C Choy by Sergio Fontana VK3CWX.

AR

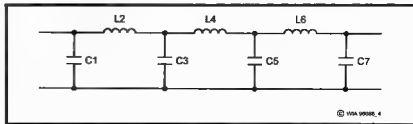


Figure 4

© VSA 9908E, 4

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

J (J)	GRAY	VK2BGJ
H E	WILTSHIRE	VK2DEW
T G	THORPE	VK2QT
M (Mal)	LE MAISTRE	VK3UE
E (Ted)	HOWELL	VK3ZKP
J A (Joe)	ELLIS	VK4AGL
D M (Dudley)	ROBSON	VK5PF

Adrian Christy VK2ACY

Adrian VK2ACY passed away on 24 January 1997. Adrian's adolescence was spent in Cessnock where his training qualified him as a Dental Surgeon. He practised at Port Macquarie, Scone and finally at Wallsend.

Adrian's initial interest in amateur radio was stimulated by his life-long friend Chris Cowan VK2PZ, who passed away three years ago, and later by Peter Alexander VK2PA, obtaining his licence in 1961. His mellifluous and lucid articulation, combined with humorous anecdotes, qualified him as a predominant and easily identified rag-chewer.

A man who lived a full life, compassionate to all, especially the underprivileged, his retirement was at Silverwater where his main interests were gardening and wood-turning, and amateur radio to the end.

He leaves behind his work-mate and wife, Lexie, and son Jon VK2YJC, plus a lot of memories for all who knew him. Ade, you did it your way!

Les VK2AXZ

George Sheeran VK2BQS

George Edward Sheeran of Mollmook NSW passed away on 26 March 1997. He had held an amateur radio licence since 1946.

George joined the RAAF in 1940 as a trainee W/T operator, and after training at the Marconi School in Melbourne and the RAAF

Signals School at Point Cook, he was posted to Parkes, Townsville, Port Moresby and East Sale. He was then sent to Watheroo Magnetic Observatory in Western Australia for duty involving radio propagation research and to assist and maintain the ionospheric recorder.

Since his discharge he maintained an active interest in amateur radio and kept regular scheds with friends in Melbourne, Wangaratta and Sydney, to name a few. He had been a member of the Mid South Coast Amateur Radio Club for 14 years and served as President and Treasurer of that Club.

George leaves his wife Bettie, son Roger, and four grandchildren. He will be sadly missed by all who knew him.

Stan Bourke VK2EL

E (Ted) Howell VK3ZKP

Ted Howell passed away on 14 February 1997. Ted belonged to two radio clubs. First was *The Northern Suburbs Radio Club* which Ted joined in 1965. Ted didn't have a callsign, but the club members tutored him and he soon became VK3ZKP. He was an active club member until he died.

The second club was *The Western and Northern Suburbs Amateur Radio Club* of which Ted was a foundation member and Vice President when the club commenced in 1970. He was made a life member in 1985 and was a committee member several times during the intervening years. Ted was an active worker in club affairs and President of the Hall Management Committee at the time of his death.

Ted will be missed by all who knew him.

Tom VK3AGH, Bob VK3BU

BT

What's New

Dan Jackson VK3DBB introduces new products of interest to radio amateurs



AC Filter

Worried about lightning strikes or power surges on your latest black box, computer or other high tech goodies?

EDOR ELECTRONICS has just released a new, fully approved device designed not only to protect micro-processor based equipment from lightning surges, but also from induced distant lightning pulses and RF interference.

The device is Australian made and has SEC approval V89324. It is said to incorporate four levels of protection, being primary and secondary RFI filters, a surge

voltage limiting circuit, and an earth line choke.

About the same size as a double power point, the unit plugs directly into a 240 volt power point, and is claimed to have a maximum current carrying capacity of 10 amps at 40 degrees C. RF attenuation peaks at 74 dB, with particular attention given to 27 MHz.

Further details can be obtained direct from the manufacturer. Contact Fred Rode VK3AFR on 03 5345 3633.

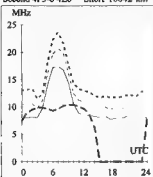
*55 Ryan Road, Pakenham VIC 3810

BT

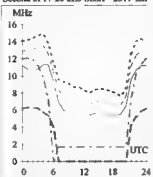
**Tell the
advertiser you
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Amateur Radio
magazine!**

Adelaide-Johannesburg 237

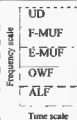
Second 4F5-6 4E0 Short 10042 km

**Brisbane-Christchurch 141**

Second 2F17-20 2E5 Short 2517 km

**HF Predictions**

Evan Jarman VK3ANI

T Index: 18

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits. This also indicates a possibility of communication (percentage).

The frequencies, identified in the legend, are -

Upper Decade (F-layer, 10%)

F-layer Maximum Usable Frequency (50%)

E-layer Maximum Usable Frequency

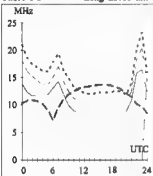
Optimum Working Frequency (F-layer, 90%)

Absorption Limiting Frequency

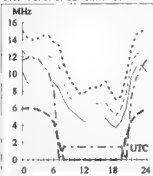
The predictions were made with the Ionospheric Prediction Service program, ASAPS V3.2. The T index used is shown above the legend. The Australian terminal azimuth, path and propagation mode are also given for each circuit.

Adelaide-London 132

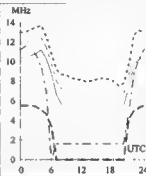
First F 0-5 Long 23755 km

**Brisbane-Honiara 21**

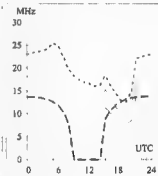
Second 2F21-25 2E7 Short 2131 km

**Canberra-Auckland 102**

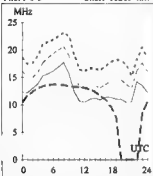
Second 2F19-22 2E6 Short 2300 km

**Darwin-San Francisco 54**

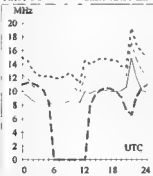
First F 0-5 Short 12316 km

**Adelaide-London 312**

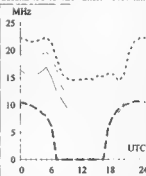
First F 0-5 Short 16269 km

**Brisbane-Montevideo 154**

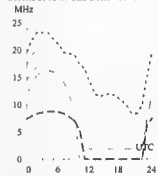
First F 0-5 Short 12431 km

**Canberra-Honolulu 50**

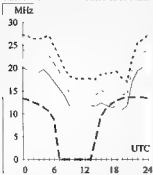
Second 4F8-13 4E0 Short 8407 km

**Darwin-Singapore 295**

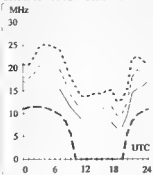
Second 2F12-17 2E2 Short 3351 km

**Adelaide-Los Angeles 66**

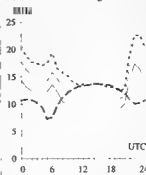
First F 0-5 Short 13158 km

**Brisbane-Tokyo 348**

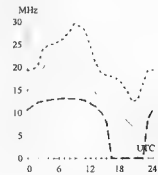
Second 3F6-11 3E0 Short 7199 km

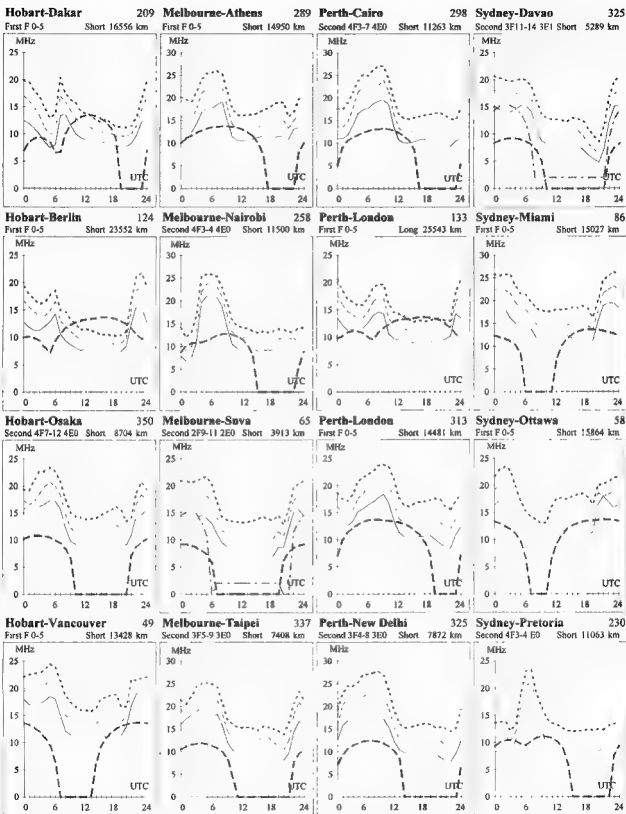
**Canberra-Paris 130**

First F 0-5 Long 23102 km

**Darwin-Tel Aviv 301**

Second 4F3-8 4E0 Short 11303 km





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- Eight lines (forty words) per issue free to all WIA members, ninth and tenth lines for name and address. Commercial rates apply for non-members.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment offered for sale should be included in the Hamad.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.
- Commercial advertising (Trade Hamads) are pre-payable at \$25.00 for four lines (twenty words), plus \$2.25 per line (or part thereof), with a minimum charge of \$25.00. Cheques are to be made out to: WIA Hamads.
- Copy should be typed or in block letters, and be received by the deadlines shown on page 1 of each issue of *Amateur Radio*, at.

Postal: 3 Tamar Court, Mentone VIC 3194
 Fax: (03) 9584 8928
 E-mail: vk3br@c031.aone.net.au

TRADE ADS

- **AMIDON FERROMAGNETIC CORES:** For all RF applications. Send business size SASE for data/purchase to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please). 14 Boony Ave (Kiama) Agencies at: Webb Electronics, Albany; Asko TV Service, Hobart; Truscott Electronic World, Melbourne and Mildura; Alpha Tango Products, Perth; Haven Electronics, Nowra and WIA Equipment Supplies, Adelaide.
- **WEATHER FAX programs** for IBM XT/ATs *** "RADFAX2" \$35.00, is a high resolution shortwave weatherfax, NI se and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder *** "SATFAX" \$45.00, is a NOAA Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, +137 MHz Receiver *** "MAXISAT" \$75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5 25" or 3 5" disks (state which) plus documentation, add \$3.00 postage ONLY from M Delaplante, 42 Villiers St, New Farm QLD 4005 Ph 07 358 2785
- **HAM LOG v3.1** - Acclaimed internationally as the best IBM logging program. Review samples AR. "Recommend it to anyone". The Canadian Amateur "Beyond this reviewer's ability to do it justice. I cannot find anything to improve on. A breakthrough of computer technology" ARA "Brilliant" Simple to use with full help, the professional HAM LOG is immensely popular (now in its 5th year), with many useful, superb features. Just \$59 (+ \$5 P & P), with a 90-page manual. Special \$ hour Internet offer. Demos, brochures available. Robin Gandevia VK2YN 02 369 2008 BH fax 02 369 3069
 Internet address rhg@ozemail.com.au

FOR SALE AOT

• **Hewlett Packard 410B** RF voltmeter to 700 MHz, \$125. **606A** signal generator to 65 MHz, \$475. **8900B** RF peak power meter to 2 GHz, \$465. **3476B** digital multimeter, portable, \$125. **5265A** digital voltmeter, plug-in, \$125. **HPS245** plug-in counter. Peter VK1CPK, 06 231 1790.

FOR SALE NSW

- **Transmitting valves**, four only 805s, two only 813s, one only 5894. John VK2NDR, QTHR, 048 711 343.
- **Estate late VK2VBG FT200**, s/n 351328, working, with homebrew PSU, manual and circuit, **Emtron EP2000** SWR meter, \$175 the lot, as is VK2YO, QTHR, 066 742 095.
- **Log periodic beam**, all bands on HF, good condn, post COD anywhere, \$300 plus post. VK2EJV, 066 895 137 BH.
- **Yaesu FT-ONE** HF txcvr, s/n 1M010234, continuous coverage from 150 kHz to 30 MHz, complete with instruction and comprehensive workshop manuals, all options including FM, AM and CW keyer boards, FM, AM and CW (500 and 250 Hertz) filters, YM-35 dynamic and Shure 444 microphones, recently maintained by Agent DSE and little used since, \$1,000 cash. **Henry Tempo 50A10**, 144-148 MHz amplifier, s/n 34-2656, 10W drive, 50 W output at 13.8 V, complete with manual, \$100. **Pakett 232**, PK 232 packet modem, s/n 8978, with all documentation, \$450. **Transmitting valves**, **Phillips QX606/40** at \$30, **QX603/20** at \$20, brand new in original boxes. **AWA VoltOhmyst**, VTM, s/n 368, as new condn in original box and complete with probe and manual, \$150. **Electro Parts Aust P/LC**, VC-5, 24 VDC to 12 VDC converter, 5 A continuous, 10 A peak at 13.6 V, \$50. **Power supply**, **Transwest MK IV**, s/n 2154, 13.8 V regulated at 6 A, 50% duty cycle, \$50. **DSE one GigaHertz** frequency counter, assembled

kit, work fine, \$150. **Yew photo tachometer model 2607**, s/n 012568, with instruction manual, in new condition in velvet lined case, \$150. All items available for inspection at QTHR. Cash only. Will deliver to Newcastle area but sorry will NOT pack and post. Les Baber VK2RJ, QTHR, 065 431 942, e-mail lesbaber@ajan.com.au

- **Pacocom pactor Altos 3068** computer, 4 Mb RAM, all manuals, software. **Hamtronics UHF Tx/Rx converter** Homebrew 2 m power amp. Large aluminium loop antennas. **Sony ICF-2001** receiver 400 QRP ng. **Adnan VK2ALF**, QTHR, 064 525 555.
- **MFJ-748B** tuneable DSP filter, \$325. **VK2AYD**, QTHR, 065 85 2647.
- **572B/160TL** tubes, pair, new, made in USA by Cetron, suit Yaesu FL2100B/Z 1000 W amp, \$300 the pair. **Ted VK2EZQ/M**, QTHR, 019 460 437 (leave message).

• Due to ill health I have dismantled my station and am selling all my equipment regardless of cost. Here is a chance of a bargain, so make me an offer! **Vintage book**, *School Magnetism & Elec* 1906 Ed., several old books on banking, *Radiotron Amateur receiver*, *Principles of Radar*, *Standard Handbook for Electrical Engineers* (7th Edition), **TH6DXK** 6 el Hy-gain ant, two 32 ft lattice masts (one with pipe extension and rotator), five band Hustler vertical ant, 10 m base station ant: **Novice band vertical ant**, G-whip mobile ant, spring mount for mobile ant, magnetic base for mobile ant, 30 m unused heavy duty coax, 2 brand new CV2245 power tubes, still in cartons, two 572B power tubes, 6 ft steel PMG-type equipment rack, **Datong FL-Way** filter to reduce QRM (for CW & SSB), **Hi-Way** phone and mic headset, new dual floppy disk drive 5 1/4", **MX701** Hi-mount paddle key, code practice oscillator, **FT-ONE** txcvr in mint condn, **Tone 9000E** for CW and RTTY; variable DC PSU (10-20 V 200 mA), **Osken Block SWR** meter; **Heathkit VTYM** Model II-11, **Sony desk mic** and two h/nd mics. **Hansen multimeter** Model FN Offers and information Gordon VK2DGS, 02 9924 2052.

- Deceased estate of VK2FFH. **Kenwood TS-430S**, overhauled at Kenwood, with mc, manual, \$950. **Kenwood PS-430**, PSU. **Kenwood SM-220** station monitor, \$200. **Kenwood TM-201A** 2 m txcvr, \$250. **Kenwood TR-8400** UHF txcvr \$350. **Kenwood R-1000** com receiver, \$250. **Alfined DR-1107** 2 m txcvr, \$250. **Azden PCS2000** 2 m txcvr, \$250. **John VK2FUR**, 046 251 812.
- **Yaesu FT-901D** txcvr, YM-34 desk mc, service manual, \$550. **ONO Yaesu FT-1012D** txcvr, YD-148 desk mc, \$550. **Yaesu FT-101E** txcvr, YD-148 desk mc, \$500. **Yaesu FT-209RH** 2 m txcvr, car adapter, charger, speaker/mic, \$400. **Yaesu FV-901** scanning VFO, \$250. All items in VGC. **Peter VK2DJB**, QTHR, 063 675 095.
- 4 metre broadcast dish, two section, easy to transport, swap for amateur radio or ATV equipment. **Joe L12028**, 02 9608 1384.

FOR SALE VIC

- **Kenwood TS-130V** (low power version of TS 130), 80 - 10 m (incl WARC bands) txcvr, IF shift, speech processor, CW filter, operating and workshop manuals, mc, DC cable, immaculate condn, \$400. **Reg VK3CCE**, QTHR, 03 9509 1471.

- **Kenwood TS-520S HF txcvr**, Kenwood DGS digital display, Kenwood SP520 speaker, Kenwood AT2000 tuner, Kenwood MC50 mike, \$750. Healesville ARC Inc. Contact Graeme VK3CPT, 03 5962 6098 (transmitting gear sold to licensed amateurs only).
- **Beam antenna, TET HB33M**, operating, \$300. **MD IB 8 microphone**, as new, \$200. Peter Johnson VK3AJR, 03 9822 3783.
- **Icom IC-271H**, 2 m all mode base station, \$900. Bert VK3DZY, QTHR, 03 5221 6804.
- **Racal RA17L communication Rx**, excellent condn, no mods, with book and spare tubes, \$650. **Icom IC-2A**, VHF, with speaker mic, \$120. **BC312D receiver**, no PSU, has some mods, \$180. **Peter VK3IZ**, PO Box 212, Metung VIC 3904, 03 5156 2053.
- **Kenwood TL-922 linear amplifier**, \$2250. Roy VK3ARY, QTHR, 03 9807 4798.
- **Kenwood TS-870 HF txcvr**, s/n 80300020, with h/eld mic, in very good condn, \$3,100. **Kenwood PS-52** 2 A PSU, s/n 50700115, VGC, \$460. Jim VK3NR, QTHR, 03 9367 6920.
- **Kenwood TS-450SAT**, HF txcvr, auto ATU, speech board, in mint condn, little use, \$1350 **ONO**, or consider 440 trade-in. Graeme VK3QS, 03 9435 4336.
- **Yaesu FT-102 HF txcvr**, 160 – 10 m plus WARC bands, CW, AM, SSB and FM, digital frequency display, excellent condn with copy of manual and hand mic, no mods, \$650. **2 m amplifier**, FM/SSB, 12 V, in-built Tx/Rx switching and filters, UHF connectors, max input 5 W, output 25 W, large heat-sink, has been constructed from quality commercial kit, spare output transistor included, great for hand-hands and packet radio, \$100. Chris VK3KCP, 03 9629 2653.
- **Icom IC-271A** 2 m all mode base txcvr, complete with IC-PS25 internal 240 VAC power supply, MH-12 mic, manual, DC lead, VGC, s/n 2185, \$750. Brian VK3KQB, QTHR, 03 5453 1300.
- **Vibroplex iambic paddle**, good working condn, \$150. David VK3DNG, QTHR, 03 9859 4698.
- **MFJ-949 deluxe ATU**, 300 W, in-built dummy load, 6 position antenna selector, 4:1 balun for balanced line and wire, crossed needle meter for forward/reflected power and SWR, as new condn with circuit and instructions, \$180. **Diamond GH62** vertical ant, single band 6 m, 6 dB, 200 W, full instructions, still in carton, mint condn, \$120. John VK3CJA, 03 5964 7520 (all hours).
- **New Penta 6146B tubes**, \$67.50 per pair. **HP Schottky diodes**, 5082-2800 series, matched pairs, \$2.80 per pair. John VK3ATL, 03 9481 6771.
- **Yaesu FT-290R II**, 2 m all mode txcvr, very good condn, carry case, original box, manuals, etc, \$500. **Philips FM-828s**, one each of VHF low, VHF, and UHF band radios, unmodified, \$50 each. Richard VK3JFK, 03 9693 4403 BH, 03 9354 8195 AH.
- **Icom IC-730 HF 100 W txcvr**, 3.5 – 30 MHz incl WARC bands, SSB-AM-CW, twin VFO, mobile/home mic, manual, beat condn, \$500. **Variac 0-280 V 2 A**, not perfect but good working order, \$5. **SWR/Pwr meter**, 50/70 ohm switch, two meters, illuminated, robust, \$10. Stan VK3SZ, QTHR, 03 9795 7848.
- **PK-232** multi mode data controller, s/n 14261, HF/VHF, with manual, no MBX, etc, \$275. **Himond HK-708 Morse key**, etc, \$30. Bob VK3CAY, QTHR, 03 9398 2714.
- **Chirnside CE-35** five el tri-band antenna, \$250 (licensed amateurs only). **17 ft free standing aluminium tower**, solid construction, \$150. Laurie VK3DDP, QTHR, 03 9818 6009.
- **Kenwood TS-700SP**, 2 m all mode txcvr, \$650 **ONO**. **Icom IC-730 HF txcvr**, \$600 **ONO**. Damien VK3RX, 03 5427 3121.

- **Icom IC-725 HF txcvr**, very good condn, \$995. Bill VK3WK, QTHR, 03 5561 1376.
- **Marconi FT144G/4 HF signal generator**, working, battle-ship size, suit museum, \$200. **Ken 202-2** 6 channel hand-held with crystals, \$50. **Icom IC-22S** 2 m mobile txcvr, \$150 **ONO**. Mike VK3WW, QTHR, 03 5433 3654.
- **Decayed estate VK3BHG**. Tower, self-supporting, 20 m triangular gal tubing, tilting top section, \$200. **75 ohm coax**, 3 m, \$25. **75 ohm coax**, 25 m, \$15. **Emotator 502GAX** rotator, complete, \$250. **75/75 ohm balun**, 502 3/1 coax switch, \$40. **Sanyo VC700 security system**, with intercom, monitor, cable and PSU, (2 only), \$250 each. **DSE Commander K6308** 2 m, \$150. **Round sound 40 CH CB**, \$40. **GE 3-5105 cassette recorder**, new, \$30. **Telesonic TE 225 video head tester**, \$50. **UHF Yagi**, 18 el, \$200. **UHF Yagi**, 11 el, \$130. **Keith VK3AFI**, 03 5221 3658, or Ben, 03 5250 1605.
- **Regulated PSU**, fully protected and RF proof, 13.6 V 20 A continuous, tested at 25 A for 24 hours continuous, designed and built by VK3AFQ, only few hours use, \$325 **ONO**. Coax switch, five position, Barker & Williamson USA, \$30. **Allan VK3AMD**, QTHR, 03 9570 4610 any time.

FOR SALE QLD

- **Kenwood TS-530S**, s/n 1121004; **MFJ941** tuner; **Dalong ASP217/ASX3** preselector; **Archer Low-pass filter**; **EP-2000 SWR meter**; **MC50 mic**; **EB31 rotator**; **Tri-band dipole 20-15-10 m**; **Clipsal power filter**, etc. \$1100 the lot (licensed hams only). H Cox VK4OX, QTHR, 07 5497 5308.
- **Icom IC-275H**, VHF all mode txcvr, 100 W output, s/n 01918, near new condn, \$1500. **Yaesu FT-757G2 HF txcvr**, s/n R390286, excellent condn, \$800. **Goldstar oscilloscope**, 40 MHz, dual channel, s/n 9010560, near new condn, \$750. **VK4PO**, QTHR, 07 3408 6005.
- **Massive shack clearance!** Complete radio collection must go, 1000s of components, old and new. 100s of valves. Transmitters, receivers, ex-military, many in working order. Collectors send for complete lists (SAE) to VK4DIT, Box 6220, GCMC QLD 4217. Request list from harvest@technet2000.com.au. Visitors welcome, phone 018 752 467.
- **Drake's cyclopedia**, 1993 edition, covers frayed otherwise good condn, \$35. Peter VK4APD, QTHR, 07 3397 3751 AH.
- **Ailinc DJ-GIT/GIE VHF/FM hand-held txcvr**, complete with extras, s/n TOC4261, as new, \$390. **Digitor D-2150** 2 m RF power amplifier, as new, \$90. **Revex W540 SWR** and power meter, 140-525 MHz, as new, \$90. Kevin VK4MAA, QTHR, 07 5446 3492.

FOR SALE SA

- **Yaesu FT-102 HF txcvr**, s/n 20030938, **IC-102 1.2 k W ATU**, s/n 21010284, **FT-707 HF txcvr**, s/n OK101217, **FV-107 ext VFO**, s/n 3F040334, **YD-148** desk mic, plus other bits and pieces. Phone for details. Can deliver anywhere in Australia or New Zealand. David VK5AXW, QTHR, 08 8370 1066 BH, 08 8370 9569 AH.
- **Kenwood TS-850SAT**, s/n 30801036, HF all bands/modes txcvr, general coverage Rx, auto ATU, complete with all optional xtal filters and matching **Kenwood PS-52 heavy duty PSU** (s/n 30800299), including **MC60** desk microphone, **SP-31** speaker unit, and users hand-book, little used, \$3,200. Dave VK5NU, QTHR, 018 811 070.
- **Yaesu FNB-14.7.2 V 1000 mA H battery pack**, new, never used, \$50. **FNB-11 12 V 600 mA H battery pack**, \$40. These suit FT-411 series, FT-23R series, FT-470, etc. **Dick Smith 27278 MHz SWR/Field Strength Meter**, \$10. John VK5KBE, 08 8250 7259.

FOR SALE TAS

- **Kenwood TS-690SAT txcvr**, \$2000 **ONO**.

- **Kenwood SP-23** ext spkr, \$80 **ONO**. **Kenwood PS-51 PSU**, \$300 **ONO**. **Kenwood MB-430** mobile mount, \$300. **Icom FL102 AM filter**, suit IC-760, 761, 765, 575, new, \$65. All above as new with manuals, boxes, etc. On behalf of VK7ZA, contact AIVK7AN, 03 6327 1171, mobile 0417 354 410.
- **Estate VK7WA**. **Kenwood TS-530S**, s/n 2040385; **Yaesu FT-77**, s/n 2N010082; **Yaesu FT-102**, s/n 2H010857; **Yaesu FT-200** txcvr, s/n 349385; **KDK 2 m txcvr**, s/n 0030404; **Kenwood all mode 2 m txcvr**, s/n 5110105; **HF helical mobile whips**; **Datong RF auto speech processor**; **MFJ RF noise bridge**; **Electro-voice 638 dynamic mic**; many valves, new. K A Hancock VK7KH, QTHR, 03 6431 2164.

WANTED NSW

- **Morse keys** and Australian semi-autos, especially **AutoMorse**, **Buzza** 100 and **MacDonald Pendograph** (vertical bugs), pay top dollar for good condn keys. **Steve VK2SPS**, 02 9999 2933 after 6 pm.
- **Antennas**: **GAP Voyager**, 3 el 40 V Yagi, ether **KLM**, **Hygain** or **Cushcraft**; **base and chimney for 4-1000 valve**; **SSB Electronics UK2E000S converter**; **Collins S1S-1 receiver**; **Drake PS-7 PSU**, **Ham-M antenna rotator**. Tom VK2OE, 046 461 024 evenings.

WANTED VIC

- **Tower sections**, approx 5 m, aluminium or steel (no rust), to build a small tower. Graeme VK3QS, 03 9435 4336.
- **Sat Track 4 track box kit**, or complete, **Max Brighton VK3ZMT**, 03 5023 2504, vk3zmt@mildura.net.au
- **Dynamotor DM33**, used with modulator BC-456 in Command Tx. Also modulator BC-456 and Tx rack. **Tuning shafts** with spline for command Rx. Two only 1235 valves, and any SCR-274N assemblies (Command). **Handbooks for AN/GRC-27 UHF Tx/Rx** as used by RAAF Peter VK3IZ, PO Box 212, Metung VIC 3904, 03 5156 2053.
- **Dud Yaesu FNB-4 battery pack**, housing must be in good condn, reasonable price paid, John VK3ATL, 03 9481 6771.
- **Travelling wave tube RF power amplifiers**, HP, Varian, Hughes, etc to cover part or all of the range 1 – 18 GHz, power levels of 10 W or greater preferred, but all options will be considered. Eric VK3AX, 03 9762 6733 BH, 03 5968 4202 AH.

WANTED QLD

- **Circuit or workshop manual for Codan txcvr Type 6801 Mk2**. Please send details of cost and other expenses to Bert VK4AO, 41 Spenser Street, Iluka NSW 2466.
- **RCA receiving tube manual RC-28** 1971/12 **Tetrode** Tx tubes 4-400, 4-1000, QY-5-500, etc. Peter VK4APD, QTHR, 07 3397 3751 AH.
- **Icom IC-2SR** 2 m hand-held txcvr and scanner. P Renton VK4PV, QTHR, 07 721 236 AH, 07 8715 123 BH.

WANTED SA

- **Case for R-5223 RS** made by TCA 1965, approx 410 mm W x 270 mm D x 215 mm H, with 24 holes for screws. **Circuit for Gonsert GSB-100 Tx**. **Radio and Hobbies** October 1952, January 1943, May 1944; have various issues for swap. Andy VK5AAQ, phone/fax 08 8322 1010.
- **Fukiyama Multi 8000** 2 m mobile FM txcvr, in any condn, 25 W, 800 channels, FDK-Multi. Mervyn VK5MX, QTHR, 08 8346 7042.

MISCELLANEOUS

- **THE WIA QSL** Collection (now Federal) requires QSLs. All types welcome especially rare DX pictorial cards special issue. Please contact Hon Curator Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, Tel 03 9728 5350.

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division	Address	Officers	Weekly News Broadcasts	1997 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Hugh Blamings Secretary John Woolner Treasurer Les Davey	VK1YYZ VK1ET VK1LD 3.570 MHz LSB, 146.950 MHz FM each Sunday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet, www.amateur.misc newsgroup, and on the VK1 Home Page http://mail.nla.gov.au/~cmakin/wiaact.html From VK2W1 1.845, 3.595, 7.146*, 10.125, 14.160, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (* morning only) with relays to some of 18, 130, 21, 170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on the Internet newsgroup www.radio.amateur.misc , and on packet radio.	(F) \$72.00 (G) \$55.00 (X) \$44.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta 2124) Phone 02 9689 2417 FreeCall 1800 817 644 Fax 02 9633 1525	President Geoff McGorrey-Clerk Secretary Eric Fossey Treasurer Eric Van De Weyer (Office hours Mon-Fri 11.00-14.00)	VK2EO VK2EYF VK2KUR Web: http://mercon1.mpc.mq.edu.au/wia e-mail address: wianew@sydney.dialix.oz.au Packet BBS: VK2W1 on 144.850 MHz	(F) \$66.75 (G) \$53.40 (X) \$38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton VIC 3147 Phone 03 9685 9261 Fax 03 9685 9266	President Jim Unton Secretary Barry Wilson Treasurer Rob Halsey (Office hours Tue & Thur 0630-1530)	VK3PC VK3XV VK3NC VK3BWI broadcasts on the 1st Sunday of the month, starts 10.30 am. Primary frequencies 1.840 AM, 3.615 LSB, 7.065 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH and VK3RQW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS.	(F) \$75.00 (G) \$61.00 (X) \$47.00
VK4	Queensland Division GPO Box 636 Brisbane QLD 4001 Phone 074 96 4714	President Rodger Bingham Secretary Malcolm McIntosh Treasurer Bill Sebbens e-mail address: wiaq@tmbris.mhs.oz.au	VK4HD VK4ZMM VK4XZ 1.825 MHz SSB, 3.605 MHz SSB, 7.116 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) \$74.00 (G) \$50.00 (X) \$46.00
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone 08 8352 3428 Fax 08 8264 0463	President Ian Hunt Secretary Graham Wiseman Treasurer Joe Burford	VK5QX VK5QU VK5UJ Web: http://www.vk5wia.ampr.org/ 1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Midura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide, (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday, 3.585 MHz and 146.675 MHz FM Adelaide, 1930 hrs Monday.	(F) \$75.00 (G) \$61.00 (X) \$47.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone 09 351 8873	President Wally Howse Secretary Christine Bestin Treasurer Bruce Hedland-Thomas	VK6KZ VK6SLZ VK6OO 146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.550, 7.075, 14.116, 14.175, 21.385, 29.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busseton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday, relayed on 1.865, 3.563 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(F) \$62.00 (G) \$50.00 (X) \$34.00
VK7	Tasmanian Division PO Box 271 Riverside TAS 7250 Phone 03 6327 2096 Fax 03 6327 1738	President Ron Churcher Secretary Barry Hill Treasurer Mike Jenner	VK7RN VK7BE VK7FB 146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.825 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs.	(F) \$74.00 (G) \$50.00 (X) \$46.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).			

Note: All times are local. All frequencies MHz.

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Yaesu FT-50R

2m/70cm Handheld

For the foremost in top performing, durable, and economical dualband handhelds, there's now only one choice, Yaesu's amazing new FT-50R!

Manufactured to rigid commercial grade standards, the FT-50R provides 2m and 70cm band transceive coverage plus an amazingly wide receiver range (76-200, 300-540, 590-999MHz*), all in a compact package with water resistant construction that's tough enough to meet the USA MIL-STD-810 rating for shock and vibration resistance, yet is easy to hold and use.

Measuring just 57 x 99 x 30mm (WHD) with the supplied FNB-40 650mA/H Nicad pack, the FT-50R provides 2.0w RF output on the 2m and 70cm bands as standard, and can provide up to 5.0w output when operated from a 12v source (optional Nicad battery or vehicle lead). It also provides 112 memory channels including two Home memories, an Alphanumeric display for channel naming (ie. repeater locations or callsigns) with Omni-glow backlighting, and CTCSS encode for accessing repeaters that require a tone input. Selectable AM/FM receive modes allow for greater flexibility during extended receive operation.

For ease of use, the FT-50R provides super loud speaker output, an Auto Range Transpond System to determine if you are in range of another ARTS equipped transceiver, a Dual-watch system for monitoring sub-band activity, and four Battery saver systems for longer operating times. A selectable LCD voltmeter also allows you to monitor battery performance under load so you can estimate remaining battery life. You can also use the FT-50R with the optional ADMS-1C Windows based PC software/interface to quickly program features or clone programming to other compatible Yaesu radios.

The FT-50R is tough, easy to use, and one of the most economical dualband handhelds you can buy. There's now only one choice, the FT-50R from Yaesu.

(* Cellular blocked)

D-3660

Limited stocks of the earlier version, with standard keypad, are still available.
D-3655 \$499



\$599

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